ERASTUS NICE

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THE FARMER'S

Complete Encyclopedia

A COMPENDIUM OF PRACTICAL INFORMATION ON ALL SUBJECTS RELATING TO THE FARM AND HOUSEHOLD.

Compiled from the most Reliable Sources.

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A List of the Principal Books Consulted in the Preparation of this Encyclopedia.

The New American Farm Book, R. L. and L. F. Allen. *Talks on Manures*, Joseph Harris, M. S. *Dairy Farming*, Prof. J. P. Sheldon. *Every Horse Owner's Cyclopedia*, J. H. Walsh. F. R. C. S. *The Book of the Horse*, by Samuel Sidney. *The Modern Horse Doctor*, Geo. H. Dadd, M. D. *The Complete Farrier*, Jno. C. Knowlson. *American Cattle*, Lewis F. Allen. *American Stock Book. American Cattle Doctor*, Geo. H. Dadd, M. D. *Cattle and their Diseases*, Robert Jennings, V. S. *American Gentleman's Stable Guide*, Robert McClure, M. D., V. S. *Randall's Sheep Husbandry. Milch Cows and Dairy Farming*, Chas. L. Flint. *Injurious Insects*, A. J. Cook. *Sheep, Swine, and Poultry*, Robert Jennings, V. S. *Illustrated Book of Poultry*, L. Wright. *The Pig*, H. D. Richardson. *Poultry*, Elizabeth Watts. *The Horticulturist*, J. C. Loudon. *Domestic Medicine and Surgery*, J. H. Walsh, F. R. C. S. *The Modern Householder*, Ross Murray. *The Family Physician. A Handbook of Nursing*, Catharine J. Wood. *Cassell's Dictionary of Cooking*. And files of the principal agricultural papers.

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"THE HORSE FAIR."

THE FARM.

Manures.—In their broadest sense, manures embrace every material, which, if added to the soil, tends to its fertilization. They are appropriately divided into organic and inorganic; the first embracing animal and vegetable substances which have an appreciable quantity of nitrogen; the last comprehending only such as are purely mineral or earthy, and which in general contain no nitrogen. These characteristics are sometimes partially blended, but they are sufficiently distinct for classification.

Much pertinacity has been exhibited by some highly intelligent minds, who should have entertained more liberal views, as to the peculiar kinds of manures necessary to support a satisfactory productiveness. We have seen that Tull maintained that the deepening and thorough pulverization of the soil was alone sufficient to secure perfect fertility. But this crude notion, it is evident to the most superficial modern reader, is wholly untenable. Some agriculturists of the present day, however, while they scout at the theory of Tull, (who was really a shrewd man for his day,) will yet claim as essen-

tial to successful vegetation, the existence in the soil of but a part only of the food of plants. Thus, one asserts that the salts alone will secure good crops; others maintain that the nitrogenous substances are the true source of fertility; while still another class refer to the presence of humus or geine (the available product of vegetable and animal decay in the soil) as the only valuable foundation of vegetable nutriment in all manures. Truth and sound practice lie between, or rather in the combination of all these opinions.

It is obvious that such principles as all fertile soils furnish to vegetables must be contained in manures. It is no satisfactory answer to this position to assert that numerous experiments have apparently been successful, of growing plants in pure sand and water; or with charcoal and the salts added; or even that there are some atmospheric plants that fulfill their zoophytic existence in air. Growth may continue for a long time under such circumstances; but full maturity never arrives, and probably never can, without the available presence in the soil of every element which enters into the composition of plants.

Profitable farming requires that manures embodying all these elements should be added in sufficient quantities to the soil, to develop fully and rapidly such crops as are sought from it. It becomes, then, a matter of the highest consequence to the farmer to understand, not only what substances may be useful as manures, but also how to apply them in the best manner to his crops so far as they may be made profitable.

Superphosphate of Lime.—Take a large tub, or barrel, and put into it 100 lbs. water; add, very slowly and cautiously, 43 lbs. of pure sulphuric acid; you must be very careful while handling this article not to let it touch your skin or clothing, as it will instantly blacken the skin, and destroy the clothing, wherever it comes in contact; and, when mixed with water, it engenders a very intense heat. Into this mixture throw 100 lbs. weight of bones, no matter how old or useless they may be. The sulphuric acid instantly attacks and enters into combination with the bones, reducing them to a pasty consistency, and completely dissolving them. Keep under cover, and turn them over occasionally, while the process is going on;

and, when completed, dump out the whole contents on the barn floor or on a platform of boards, and thoroughly work into the mass four times its bulk of dry bog earth or dry road dust; mix and pulverize completely with a wooden shovel. The bog earth acts as an absorbent, or dryer, retaining the fertilizing properties of the compound, and rendering it easy of uniform distribution. If whole bones are used, it will take six or eight weeks to dissolve them; if they are broken with an axe, they will dissolve in about three weeks; if they are ground in a bone mill, four days will be sufficient. This manure is the most powerful fertilizer in existence; and, when made by these directions, it is the cheapest, as one ton is equal to thirty-two tons of barn-yard manure. For top dressing grass lands, use 300 lbs. per acre; for corn, potatoes, beans, turnips, &c., apply 450 lbs. per acre in the drill, mixing with the soil; for wheat, rye, oats, or barley, 400 lbs. per acre, harrowing in with the seed; for buckwheat, 300 lbs. per acre.

Home-made Guano of Unequalled Excellence.—Save all your fowl manure from sun and rain. To prepare it for use, spread a layer of dry swamp muck (the blacker it is the better) on your barn floor, and dump on it the whole of your fowl manure; beat it into a fine powder with the back of your spade; this done, add hard wood ashes and plaster of Paris, so that the compound shall be composed of the following proportions: Dried muck, three bushels; fowl manure, two bushels; ashes, one bushel; plaster, one and one-half bushels; mix thoroughly, and spare no labor; for in this matter the elbow grease expended will be well paid for. A little before planting moisten the heap with water, or, better still, with urine, cover well over with old mats and let it lie till wanted for use. Apply it to beans, corn, or potatoes at the rate of a handful to a hill, and mix with the soil before dropping the seed. This will be found the best substitute for guano ever invented, and may be depended on for bringing great crops of turnips, corn, potatoes, &c.

To dissolve large Bones for Manure without Expense.—Take any old flour-barrel, and put into the bottom a layer of hardwood ashes; put a layer of bones on the top of the ashes, filling the space between the bones with them; then

add bones and ashes alternately, finishing off with a thick layer of ashes. When your barrel is filled, pour on water (urine is better), just sufficient to keep them wet, but do not on any account suffer it to leach one drop; for that would be like leaching your dungheap. In the course of time they will heat, and eventually soften down so that you can crumble them with your finger. When sufficiently softened, dump them out of the barrel on a heap of dry loam, and pulverize and crumble them up till they are completely amalgamated into one homogeneous mass with the loam, so that it can be easily handled and distributed whenever required. You may rely on it, this manure will leave its mark, and show good results wherever it is used.

How to Double the usual Quantity of Manure on a Farm.—Provide a good supply of black swamp mould or loam from the woods within easy reach of your stable, and place a layer of this, one foot thick, under each horse, with litter, as usual, on the top of the loam or mould. Remove the droppings of the animal every day, but let the loam remain for two weeks; then remove it, mixing it with other manure, and replace with fresh mould. By this simple means any farmer can double, not only the quantity, but also the quality, of his manure, and never feel himself one penny the poorer by the trouble or expense incurred, while the fertilizing value of the ingredients absorbed and saved by the loam can scarcely be estimated.

Josiah Quincy, jun., has been very successful in keeping cattle in stables the year through, and feeding them, by means of soiling. The amount of manure thus made had enabled him to improve the fertility of a poor farm of 100 acres, so that in twenty years the hay crop had increased from 20 tons to 300. The cattle are kept in well arranged stables, and are let out into the yard an hour or two morning and afternoon; but they generally appear glad to return to their quarters. By this process, one acre enables him to support three or four cows. They are fed on grass, green oats, corn fodder, barley, &c., which are sown at intervals through the spring and summer months to be cut as required; but he remarks that his most valuable crop is his manure crop. Each cow produces

3 1-2 cords of solid, and 3 cords of liquid, manure, or 6 1-2 cords in all. He uses twice as much muck to mix with it, making 20 cords in all. Five to 8 miles from Boston, such manure is worth five to eight dollars a cord. From this estimate, he has come to the conclusion that a cow's manure may be made as valuable as her milk

Twenty Dollars' Worth of Manure for almost Nothing.—If you have any dead animal, say, for instance, the body of a horse, do not suffer it to pollute the atmosphere by drawing it away to the woods, or any other out of the way place, but remove it a short distance only from your premises, and put down four or five loads of muck or sods, place the carcass thereon, sprinkle it over with quick-lime, and cover over immediately with sods or mould sufficient to make, with what had been previously added, 20 good wagon loads, and you will have within twelve months a pile of manure worth $20 for any crop you choose to put it upon. Use a proportionate quantity of mould for smaller animals, but never less than twenty good wagon loads for a horse; and, if any dogs manifest too great a regard for the enclosed carcass, shoot them on the spot.

Fish Compost, Substitute for Bone-Dust. Manure from Fish Refuse, &c.—The fish owes its fertilizing value to the animal matter and bone earth which it contains. The former is precisely similar to flesh or blood, consisting of 25 per cent. of fibrin, the rest being water; and their bones are similar in composition to terrestrial animals. As fertilizing agents, therefore, the bodies of fish will act nearly in the same way as the bodies and blood of animals; 100 lbs. in decaying produce 2 1-2 lbs. of ammonia. Hence, 400 lbs. of fish rotted in compost are enough for an acre. The great effect is due to the ammoniacal portion; for it renders the herbage dark green, and starts it very rapidly. One of the best composts is made as follows: Dried bog earth, loam, or peat, seven barrels; hardwood ashes, two barrels; fish, one barrel; slacked lime, one bushel. Place a thick layer of the bog earth on the bottom; on the top of this put a layer of the fish, then a sprinkling of lime, then a layer of ashes; on top of the ashes put a thick layer of bog earth, loam, or peat; then another thin

layer of fish, lime, and ashes, and so on till your materials are worked in; then top off with a thick layer of the absorbents to retain the fertilizing gases. The decomposition of the fish will proceed very rapidly, and a very rich compost will be the result. It should be shoveled over and over, and thoroughly intermixed and pulverized. Put this on so as to have 400 lbs. of fish to the acre. It may be applied with the greatest benefit to corn, turnips, potatoes, beans, &c., in the drill, and broad-cast on the grass.

Ashes from Soil by Spontaneous Combustion.—Make your mound 21 feet long by 10 1-2 feet wide. To fire, use 72 bushels of lime. First a layer of dry sods or parings on which a quantity of lime is spread, mixing sods with it, then a covering of eight inches of sods, on which the other half of the lime is spread, and covered a foot thick, the height of the mound being about a yard. In twenty-four hours it will take fire. The lime should be fresh from the kiln. It is better to suffer it to ignite itself than to effect it by the operation of water. When the fire is fairly kindled, fresh sods must be applied, but get a good body of ashes in the first place. I think it may be fairly supposed that the lime adds full its worth to the quality of the ashes, and when limestone can be got I would advise the burning a small quantity in the mounds, which would be a great improvement to the ashes, and would help to keep the fire in.

Substitute for Barn Manure.—Dissolve a bushel of salt in water enough to slack 5 or 6 bushels of lime. The best rule for preparing the compost heap is, 1 bushel of this lime to 1 load of swamp muck intimately mixed, though 3 bushels to 5 loads makes a very good manure. In laying up the heap let the layers of muck and lime be thin, so that decomposition may be more rapid and complete. When lime cannot be got, use unleached ashes, 3 or 4 bushels to a cord of muck. In a month or six weeks overhaul and work over the heap, when it will be ready for use. Sprinkle the salt water on the lime as the heap goes up.

Ashes may be pronounced the best of the saline manures. They are also among the most economical; as, from our free use of fuel, they are largely produced by almost every house-

hold. Good husbandry dictates that not a pound of ashes should be wasted, but all should be saved and applied to the land; and, where they can be procured at a reasonable price, they should be purchased for manure. Leached ashes, though less valuable, contain all the elements of the unleached, having been deprived only of a part of their potash and soda. They may be drilled into the soil with roots and grain, sown broadcast on meadows or pastures, or mixed with the muck heap. They improve all soils not already saturated with the principles which they contain.

The quantity of ashes that should be applied to the acre must depend on the soil and crops cultivated. Potatoes, turnips and all roots—clover, lucern, peas, beans, and the grasses, are great exhausters of the salts, and they are consequently much benefited by ashes. They are used with decided advantage for the above crops in connection with bone dust; and for clover, peas and roots, their effects are much enhanced when mixed with gypsum. Light soils should have a smaller, and rich lands or clays, a heavier, dressing. From twelve to fifteen bushels per acre for the former, and thirty for the latter, is not too much; or, if they are leached, the quantity may be increased one-half, as they act with less energy. Repeated dressings of ashes, like those of lime and gypsum, without a corresponding addition of vegetable or barnyard manures, will eventually exhaust tillage lands.

Salt.—As a manure, salt was extensively used by the ancients, and has ever since been employed by intelligent agriculturists. On some soils it yields no apparent benefit. Such as are near the sea-coast, and occasionally receive deposits from the salt spray, which is often carried far inland by the ocean storms; or such as contain chlorine and soda in any other forms, are not affected by it. But in other situations, when used at the rate of three to sixteen bushels per acre, the crops of grains, roots or grasses have been increased from 20 to 50 per cent. It may be applied in minute portions in the hill, or scattered broadcast, or mixed with the muck heap. Its great affinity for water has the effect, like that of gypsum, of attracting dews and atmospheric vapor to the growing vegetation, by which it is supplied with moisture in a period of

drought, much beyond what is conveyed to such as are destitute of these manures. Salt is also useful in destroying slugs, worms and larvæ, which frequently do much injury to the crops.

Old Lime Plaster, from Walls of Buildings, Etc.—For meadows, and for most other crops, especially on clays and loams, this is worth twice its weight in hay; as it will produce a large growth of grass for years in succession, without other manure. But the farmer cannot too carefully remember that with this, as with all other saline manures, but a part of the ingredients only is thus supplied to vegetables; and, without the addition of the others, the soil will sooner or later become exhausted.

Barn-yard Manure.—The bulk, solubility and peculiar tendency to fermentation of barn-yard manure, renders it a matter of no little study so to arrange it as to preserve all its good qualities and apply it undiminished to the soil. A part of the droppings of the cattle are necessarily left in the pastures, or about the stacks where they are fed; though it is better, for various reasons, that they should never receive their food from the stack. The manure thus left in the fields should be beaten up and scattered with light, long-handled mallets, immediately after the grass starts in the spring, and again before the rains in the autumn. With these exceptions, and the slight waste which may occur in driving cattle to and from the pasture, all the manure should be dropped either in the stables or in the yards. These should be so arranged that cattle may pass from one directly into the other; and the yard should, if possible, be furnished with wells, cisterns, or running water. There is twice the value of manure wasted annually on some farms in sending the cattle abroad to water, that would be required to provide it for them in the yard for fifty years.

The premises where the manure is dropped should be kept as dry as possible; and the eaves should project several feet beyond the side of the building so as to protect the manure thrown out of the stables from the wash of rains. The barns and all the sheds should have eave-troughs to carry off the water, which, if saved in a sufficiently capacious cistern, would furnish a supply for the cattle. The form of the yard

ought to be dishing toward the center, and, if on sandy or gravelly soil, it should be puddled or covered with clay to prevent the leaking and escape of the liquid manure. The floors of the stables may be so made as to permit the urine to fall on a properly prepared bed of turf under them, where it would be retained till removed; or it should be led off by troughs into the yard or to a muck heap.

Value of Liquid Manures.—The urine voided from a single cow is considered in Flanders, where agricultural practice has reached a high state of advancement, to be worth $10 per year. It furnishes nine hundred pounds of solid matter, and, at the price of $50 per ton, for which guano is frequently sold, the urine of a cow for one year is worth $20. And yet economical farmers will waste urine and buy guano! The urine of a cow for a year will manure one and a quarter acres of land, and is more valuable than its dung, in the ratio by bulk, of seven to six; and in real value as two to one. How important, then, that every particle of it be carefully husbanded for the crops.

Solid Animal Manures.—Of these horse dung is the richest and the easiest to decompose. If in heaps, fermentation will sometimes commence in twenty-four hours; and even in midwinter, if a large pile be accumulated, it will proceed with great rapidity; and, if not arrested, a few weeks, under favorable circumstances, are sufficient to reduce it to a small part of its original weight and value.

The manure of sheep is rich and very active, and, next to that of the horse, is the most subject to heat and decomposition. The manure of cattle and swine, being of a colder nature, may be thrown in with that of the horse and sheep in alternate layers. If fresh manure be intermixed with straw and other absorbents (vegetables, peat, turf, etc.,) and constantly added, the recent coating will combine with any volatile matters which fermentation develops in the lower part of the mass. Frequent turning of the manures is a practice attended with no benefit, but with certainty of the escape of much of its valuable properties. Many farmers assign a distinct or peculiar merit to the different manures. Much of this opinion is fanciful, for there is frequently more difference in the comparative value of

that from the same species, and even the same individual, at different times and under different circumstances, than from those of different species.

Manuring with Green Crops.—This system has within a few years been extensively adopted in some of the older settled portions of the United States. The comparative cheapness of land and its products, the high price of labor, and the consequent expense of making artificial manures, renders this at present the most economical plan which can be pursued. The object of this practice is, primarily, fertilization; and connected with it, is the clearing of the ground from noxious weeds, as in fallows, by plowing in the vegetation before the seed is ripened; and finally to loosen the soil and place it in the mellowest condition for the crops which are to succeed. Its results have been entirely successful, when steadily pursued with a due consideration of the objects sought, and the means by which they are to be accomplished. Lands in many of our eastern states, which have been worn out by improvident cultivation, and unsaleable at $10 an acre, have, by this means, while steadily remunerating their proprietors for all the outlay of labor and expense by their returning crops, been brought up in value to $50.

Plowing.—The time, the depth and the manner of plowing must depend on the crops to be raised, the fertility and character of the soil, and other circumstances.

Plowing Clay Lands.—Whenever practicable, these should be plowed in the fall for planting and sowing the ensuing spring. The tenacity of the soil may thus be temporarily broken up by the winter frosts, its particles more thoroughly separated, and the whole mass reduced to a finer tilth than can possibly be effected in any other manner.

The furrows of clay soils should be turned over so as to lap on the preceding and lie at an angle of 45 °; and for this purpose the depth of the furrow slice should be about two-thirds its width. Thus a furrow six inches deep should be about nine inches wide, or, if eight inches deep, it should be twelve inches wide. This will allow of the furrows lying regularly and evenly, and in the proper position for the drainage of the soil, the free circulation of air, and the most efficient ac-

tion of frosts which in this way have access to every side of them. Land thus thrown up is found to be finely pulverized after the frosts leave it, and it is comparatively dry and ready for use some time earlier than such as is not plowed till spring. For sowing, land plowed in this manner requires no additional plowing, but it is better fitted for the reception of seed than it can be by any further operation, unless by a slight harrowing if too rough. The different kinds of grain or peas may be dibbled in, or sown directly upon the surface and covered by the harrow; and, if sown very early, the grass and clover seeds require no covering, but find their best position in the slight depressions which are everywhere made by the frosts, and which the subsequent rains and winds fill up and cover sufficiently to secure a certain growth.

Plowing Sandy or Dry Soils.—These require flat plowing, which may be done when they are either quite wet or dry, but never till wanted for use. To insure flat plowing on an old sward, the depth of the furrow should be about one-half its width, and the land or ridges as wide as can conveniently be made, so as to preserve as much uniformity of surface over the whole field as possible.

Depth of Plowing.—For general tillage crops, the depth of soil may be gradually augmented to about twelve inches, with decided advantage. Such as are appropriated to gardens and horticultural purposes, may be deepened to fifteen and even eighteen inches to the manifest profit of their occupants.

Grasses.—Blue grass of Kentucky is highly esteemed for hay and pasture. The seed ripens in June and falls upon the ground, where the succeeding rains give it vitality and it pushes out its long, rich slender leaves, one to two feet in height, which in autumn fall over in thick windrows, matting the whole surface with luscious herbage. Upon these fields, which have been carefully protected till the other forage is exhausted, the cattle are turned and fattened through the winter. It maintains its freshness and nutritive properties in spite of frost, and the cattle easily reach it through the light snows which fall upon it. A warm, dry, calcareous soil seems to be its natural element, and it flourishes only in a rich upland.

The sweet scented vernal grass is an early, valuable pasture

grass, which exhales that delightful perfume, so characteristic of much of the eastern meadow. It is a late as well as early grass and luxuriates in a dry, sandy loam. It affords two, and sometimes three, crops in a single season.

Sowing Grass Seed.—Grass seeds do best when sown early in the spring, on a fine tilth or mellow soil. If this is done while the frost is leaving the ground, no harrowing will be necessary, as the spring rains wash the seed into the honeycomb left by the frost, and secure to it an early germination. They are also successfully sown in August or September, when the fall rains will generally give them sufficient growth to withstand the effects of the succeeding winter, if the land be free from standing or surface water. It has recently been the practice of many judicious farmers to renovate their old worn out meadows by giving them a coating of unfermented manure, and then turn the sod completely over. On the surface thus plowed, a dressing of well rotted manure or compost with ashes, is spread and throughly harrowed lengthwise of the furrows. The seed is then sown and slightly harrowed in, and the decomposing manure with the stubble and roots of the sod give an immediate and luxuriant growth. Grain may occupy the land with the grass seed, but, if the latter be sown alone and sufficiently thick, the young plants will exclude the weeds and occupy the soil as profitably as can be done with the grain. The English method is to mix together and sow on a single acre, without any grain, a bushel or more of various seeds, which are best adapted to the purpose.

Pasturing Meadows.—There is no objection to feeding off meadows in early autumn, while the ground is dry and the sod firm. The roots of the grass are rather benefited than injured by the browsing and the land is improved by the droppings from the cattle, and more particularly by sheep. But they should never be pastured in spring. It is economy to purchase hay at any price rather than to spring pasture meadows.

Time for Cutting Grass.—This must depend on the kind of grass. We have seen that timothy affords nearly double the quantity of nutriment in seed that it does in its early flower, and it is then much more relished by stock. Tim

othy, therefore, should never be cut except when the seed is formed. The proper time is when it is between the milk and dough state, and will nearly ripen after cutting. Orchard grass, on the other hand, although it possesses two-sevenths more nutritive value for hay in the seed, yet as it is more tender and preferred by stock when cut in the flower, and as it continues to grow rapidly afterwards, should be always cut at that time.

Curing Grass. — Many farmers do not consider the scorching effects of July suns, and the consequence is that hay is too much dried. Unless the crop be very large, grass will generally cure sufficiently when exposed in the swath for two days. When shook or stirred out, it should not remain in this condition beyond the first day, as it will lose much of its nutritive juices; nor should dew or rain be permitted to fall upon it unless in cocks. It is better, after partially drying, to expose it for three or four days in the cock. Hay should go into the barn or stack, not crisp and dry, but slightly soft and moist in its own juices, and as soon as properly cured place it under cover.

Clover.—Mode of Cultivation.—Clover may be sown broadcast either in August or September, but much better and surer early in the spring, with most of the cereal grains, or the cultivated grasses; or it may profitably constitute a crop by itself. On well prepared loams, ten or twelve pounds of good seed will frequently give a full covering to the land, while on clay twelve to sixteen pounds are necessary per acre. When sown with the grasses, four to six pounds on the first, and eight to twelve pounds on the last, soil will suffice. An additional amount of seed, as with the grasses, will give a finer quality of hay in consequence of multiplying the number of stalks; and for this purpose, as well as to insure it on every spot of the field, it should always be liberally sown. The covering, like that of grass seeds, should be of the slightest kind; and when sown very early in the spring, or on well pulverized grounds, and followed by rains, it will germinate freely without harrowing.

Time for Cutting and Mode of Curing Clover.—

Clover should be cut after having fully blossomed and assumed a brownish hue. By close cutting, more forage is secured, and the clover afterward springs up more rapidly and evenly. The swath, unless very heavy, ought never to be stirred open, but allowed to wilt on the top. It may then be carefully turned over, and, when thus partially cured, placed in high, slender cocks and remain till sufficiently dry to remove into the barn. The clover may be housed in a much greener state by spreading evenly over it in the mow from ten to twenty quarts of salt per ton. A mixture of alternate layers of dry grass hay, or straw with the clover, by absorbing its juices, answers a better purpose, while it materially improves the flavor of the straw for fodder.

Harvesting clover seed may be done generally after taking off one crop, or pasturing the field till June. Early mowing removes the first weeds, and the second growth of the clover is so rapid as to smother them and prevent their seeding, and the clover is thus saved comparatively clean. It is then mown and raked into very small cocks, and when dried at the top they are turned completely over without breaking, and as soon as throughly dried they may be carried to the threshing floor and the seeds beaten out with sticks, light flails, or, much better, with a threshing machine. An instrument, with closely set teeth and drawn by a horse, is sometimes used for collecting the clover heads from the standing stalks from which the seed is afterwards separated. A fan or clover machine may be used for cleaning the seed for market. The produce is from three to six bushels per acre, which is worth to the farmer from $5 to $8 per bushel of sixty pounds.

Pastures.—Every pasture should, if possible, be provided with running water and shade trees, or other ample protection against a summer's sun. The last can at all times be secured by a few boards supported on a light, temporary frame. Excessive heat exhausts and sometimes sickens animals, and consequently it materially diminishes the effects of food in promoting their secretion of milk, the growth of wool, flesh, etc. Pastures ought to be protected against poaching, or treading up in the spring or late in the autumn. All grounds, immediately after long and late rains in the fall, or the winter's frosts,

are liable to this when exposed to the hoofs of cattle, particularly clay lands and such as have been recently seeded.

Wheat.—Preparation of the Land for Sowing.—Wheat is partial to a well prepared clay or heavy loam, and this is improved when it contains either naturally or artificially a large proportion of lime. Lime is an important aid to the full and certain growth of wheat, checking its exuberance of straw and its liability to rust, and steadily aiding to fill out the grain. A rich mellow turf or clover lay is a good bed for it; or land which has been well manured and cleanly cultivated with roots or corn the preceding season. Fresh barn-yard manure applied directly to the wheat crop is objectionable not only from its containing many foreign seeds, but from its tendency to excite a rapid growth of weak straw, thus causing the grain both to lodge and rust. The same objection lies against sowing it on rich alluvial or vegetable soils; and in each, the addition of lime or ashes, or both, will correct these evils. A dressing of charcoal has in many instances been found an adequate preventive; and so beneficial has it proved in France that it has been extensively introduced there for the wheat crop.

Quantity of Seed and Time of Sowing.—On well pulverized, ordinary wheat soils, about five pecks of seed is sown to the acre, while rough land, clay soils, and such as are very fertile, require from six to eight. In Maryland but three pecks are frequently sown to the acre, and some of the best crops have been raised from only two pecks of seed on a finely pulverized soil. It takes more seed when full and plump than when shrunken, as there may be two of the latter to one of the former in the same measure. A difference is to be observed according to the kind of wheat, some needing more than others.

After Culture.—Harrowing in the spring by loosening the soil, adds to the growth of the crop, and the loss of the few plants is much more than compensated by the rapid tillering and vigor of those which remain. Sowing in drills and hoeing between them is much practiced in Europe. The additional amount thus frequently raised would seem to justify the adoption of this mode of cultivation in this country; and it should

at least be done so far as to give it a fair trial. On light soils rolling the wheat both in fall and spring is highly advantageous. When the growth is luxuriant, decided benefit has attended feeding off the wheat on the field in the fall or spring, taking care to permit the animals to go on only when the ground is firm. This, however, should be cautiously done, and then only by light animals, as calves, or sheep.

Harvesting.—The grain should be cut immediately after the lower part of the stalk becomes yellow, while the grain is yet in the dough state, and is easily compressible between the thumb and finger. Repeated experiments have demonstrated that wheat cut then will yield more in measure, of heavier weight, and a larger quantity of sweet, white flour. If early cut, a longer time is required for curing before threshing or storing.

Mowing or Stacking.—When stored in the straw, the grain should be so placed as to prevent heating or molding. This can only be avoided, unless very dry before carrying into the barn, by laying it on scaffolds where there is a free circulation of air around and partially through it. If placed in a stack, it should be well elevated from the ground; and, if the stacks are large, a chimney of lattice or open work should be left from the bottom, running through the center to the top; or a large bundle may be kept at the surface in the center, and drawn upwards as the stack rises, thus leaving an opening from the bottom to the roof. Additional security would be afforded by similar openings horizontally, at suitable intervals, so as to admit the air from one side to the other.

Rye.—The preparation of the soil for rye is similar to that for wheat; and it may be advantageously sown upon a rich old turf or clover lay, or after corn or roots where the land has been well manured and thoroughly cleansed from weeds. There is not an equal necessity for using a brine-steep for rye as for wheat, yet, if allowed to remain a few hours in a weak solution of saltpeter or some of the other salts, it promotes speedy germination and subsequent growth.

Sowing.—There is but one species of rye, but to this cultivation has given two varieties, the spring and winter. Like

wheat, they are easily transformed into each other by sowing the winter continually later through successive generations to change it into spring again, and the opposite for its re-conversion into winter grain. The last should be sown from the twentieth of August to the twentieth of September, the earliest requiring less seed, as it has a longer time to tiller and fill up the ground. Five pecks is the usual quantity sown, but it varies from one to two bushels, according to the quality of the soil, the richest lands demanding most. It is a practice among many farmers to sow rye among their standing corn on light lands, hoeing or cultivating it in and leaving the ground as level as possible. On such lands this is attended with several advantages, as it gives the grain an early start, and a moist, sheltered position, at a time when drought and a hot sun would check or prevent vegetation. As soon as the corn is sufficiently matured, it should be cut up by the roots and placed in compact shocks, or removed to one side of the field, when the rye should be thoroughly rolled. When sown on a fresh plowed field, it should be harrowed in before rolling.

Oats.—Cultivation.—Oats are sown at the rate of two to four bushels per acre during all the spring months, and sometimes, though rarely, in June. The earliest sown are usually the heaviest and most productive. They may occupy a turf, or follow any of the well manured hoed crops, as mentioned in the preceding grain. Sowing salt broadcast over the land, at the rate of two to six bushels per acre, has been found of use to the crop, both in furnishing it with a necessary manure and by killing insects. The seed should be well harrowed in and rolled, and no after attention is required except to destroy the prominent weeds.

Harvesting.—Oats frequently ripen unevenly, and, if there is a large proportion of such as are backward, the proper time for cutting will be as soon as the grain in the latest may be rubbed out of the straw by hand. The oat is sufficiently matured for harvesting after it has passed the milk state, and is easily compressed between the thumb and finger. The lower part of the stalk will then have assumed a yellow color, and it ceases to draw nutriment from the soil. If cut at this time, the straw is better for fodder and for other uses; the

grain is fuller; the husk lighter; and the loss from shelling, which is frequently a great item when left too late, is avoided.

Indian Corn.—The soil for corn must be dry, rich and well pulverized. Neither strong clay, wet, nor poor lands will yield good crops of corn. Land can scarcely be too rich for it, and the fresher and less fermented the manure applied to it is, unless on light, sandy soils, the better it will be for the crop. A great error is committed in raising corn as with most of our tillage crops, from not having the soil sufficiently enriched; though this error is diminished in the case of such as will not bear an excess of manure.

PREPARATION OF SEED.—Repeated experiments have demonstrated the great utility of steeping corn for twenty-four to forty-eight hours before planting, in a solution of saltpeter. This accelerates the growth of the plant, and is a protection against birds, squirrels and mice, and for a while it will keep off worms. An effectual remedy against these depredations is to add half a pint of boiling tar to a peck of seed, stirring the corn briskly for several minutes as the tar is added, till every kernel is thinly coated with it. This supercedes the necessity of the worse than absurd remedy of scarecrows.

PLANTING.—Corn may be planted in hills from three to four and one-half feet asunder, and with from three to five stalks well spread in each hill, according to the kind of seed, quality of land, etc. Thick planting gives fewer ears upon a stalk, and those of a less size. The time of planting at the North is usually within the three first weeks of May, depending much on the season.

HARVESTING.—If there be no danger of early frost, the corn may be suffered to stand until fully ripe; though, if the stalks are designed for fodder, they are better to be cut when the grain is well glazed, and this should be done in all cases where frost is expected. Scarcely any injury occurs either to the leaf or grain if the corn be stooked, when both would be seriously damaged from the same exposure if standing. The stalks of corn should never be cut above the ear, but always near the ground, and for this obvious reason: If the stalk be cut above the ear, nourishment is at an end. It may then become firm and dry, but is not increased in quantity, while, if

cut near the root, it not only appropriates the sap already in the plant, but it also absorbs additional matter from the atmosphere, which contributes to its weight and perfection. It must be perfectly dried in the field, and after this husked and carried into an airy loft or stored in latticed or open barracks. The stalks may be housed or carefully stacked for fodder.

Buckwheat.—It grows freely on light soils, but yields a remunerating crop only on those which are fertile. Fresh manure is injurious to this grain. Sandy loams are its favorite soils, especially such as have lain long in pasture, and these should be well plowed and harrowed. It may be sown from the first of May to the tenth of August, but in the northern states this ought to be done as early as June or July, or it may be injured by early frosts, which are fatal to it. It is sown broadcast at the rate of two to four pecks per acre, and harvested when the earliest seed is fully ripe. The plant often continues flowering after this, and, when the early seed is blighted, as is often the case, the plant may be left till these last have matured. As it is liable to heat, it should be placed in little stooks, of the size of a two-bushel basket, over the field, and as soon as dry, taken in and threshed out. If not perfectly dry, the straw may be stacked with layers of other straw, and, when well cured, it will be a valuable fodder for cattle. Sheep and young horses will feed and thrive as well on this as on ordinary hay.

Fruit Trees.—PLANTING.—The tree to be planted should be as young as circumstances will allow. The season is just when the leaves become yellow, or as early as possible in the spring. The ground being prepared, and the tree taken up, prune the roots with a sharp knife so as to leave none more than about a foot long; and, if any have been torn off near to the stem, prune the part, so that no bruises or ragged parts remain. Cut off all the fibers close to the roots; for they never live, and they mould, and do great injury. If cut off, their place is supplied by other fibers more quickly. Dig the hole to plant in three times as wide, and six inches deeper, than the roots actually need as mere room. And now, besides the fine earth generally, have some good mould sifted. Lay some of this six inches deep at the bottom of the hole.

Place the roots upon this in their natural order, and hold the tree perfectly upright, while you put more sifted earth on the roots. Sway the tree backward and forward a little, and give it a gentle lift and shake, so that the fine earth may find its way amongst the roots and leave not the smallest cavity. Every root should be closely touched by the earth in every part. When you have covered all the roots with the sifted earth, and have seen that your tree stands just as high with regard to the level of the ground as it did in the place where it stood before, allowing about three inches for sinking, fill up the rest of the hole with the common earth of the plat, and when you have about half filled it, tread the earth that you put in, but not very hard. Put on the rest of the earth, and leave the surface perfectly smooth. Do not water by any means. Water, poured on, in this case, sinks rapidly down, and makes cavities amongst the roots, lets in air, mould and canker follow; and great injury is done.

Cultivation.—In the first place, the ground is always to be kept clear of weeds; for, whatever they take is just so much taken from the fruit, either in quantity, or in quality, or in both. It is true that very fine orchards have grass covering all the ground beneath the trees; but those orchards would be still finer if the ground were kept clear from all plants whatever except the trees. Such a piece of ground is, at once, an orchard and a pasture; what is lost one way is, probably, gained the other. But, if we come to fine and choice fruits, there can be nothing that can grow beneath to balance against the injury done to the trees.

The roots of trees go deep; but the principal part of their nourishment comes from the top-soil. The ground should be loose to a good depth, which is the certain cause of constant moisture; but trees draw downwards as well as upwards, and draw more nourishment in the former than in the latter direction.

If crops be grown under trees in orchards, they should be of wheat, rye, winter barley, or something that does not demand a plowing of the ground in the spring. In the garden, dig the ground well and clean, with a fork, late in November, Go close to the stems of the trees; but do not bruise the large

roots. Clean and clear all well close round the stem. Make the ground smooth just there. Ascertain whether there be insects there of any sort. And, if there be, take care to destroy them. Pull, or scrape, off all rough bark at the bottom of the stem. If you even peel off the bark a foot or two up, in case there be insects, it will be the better. Wash the stems with water, in which tobacco has been soaked ; and do this whether you find insects or not. Put the tobacco into hot water, and let it soak 24 hours, before you use the water. This will destroy or drive away all insects.

But, though, for the purpose of removing all harbor for insects, you make the ground smooth just around the stem of the tree, let the rest of the ground lay as rough as you can ; for the rougher it lies the more it will be broken by the frost, which is a great enricher of all land. When the spring comes, and the ground is dry at the top, give the whole of the ground a good deep hoeing, which will make it level and smooth enough. Then go on again hoeing throughout the summer, and watching well all attempts of insects on the stems and bark of the trees.

Apples.—Apples are usually grafted on crab-stocks, but, when you do not want the trees to grow tall and large, it is better to raise stocks from the seed of some apple not much given to produce large wood. Perhaps the fall-pippin seed may be as good as any. When you have planted the tree, and when the time comes for shortening the head, cut it off so as to leave only five or six joints or buds. These will send out shoots, which will become limbs. The tree will be what they call a dwarf standard. The sorts of apples are numerous, and everybody knows pretty well which are the best.

Cherry.—Cherries are budded or grafted upon stocks raised from cherry-stones of any sort. If you want the tree tall and large, the stock should come from the small black cherry tree that grows wild in the woods. If you want it dwarf, sow the stones of a morello or a May-duke.

Currant.—There are red, white and black, all well known. Some persons like one best and some another. The propagation and cultivation of all the sorts are the same. The currant tree is propagated from cuttings. When the tree has stood

two years in the nursery, plant it where it is to stand; and take care that it has only one stem. Let no limbs come out to grow nearer than six inches of the ground. Prune the tree every year. Keep it thin of wood. Keep the middle open and the limbs extended; and, when these get to about three feet in length, cut off, every winter, all the last year's shoots. If you do not attend to this, the tree will be nothing but a great bunch of twigs, and you will have very little fruit. Cultivate and manure the ground as for other fruit trees. In this country the currant requires shade in summer. If exposed to the full sun, the fruit is apt to become too sour. Plant it, therefore, in the south border.

Grapes.—In Europe "grape-cures" are established, to which all sorts of debilitated, blood-poisoned people go, to live—aside from a little bread—entirely upon grapes, sunlight, and pure air for weeks at a time. It is one of the "regulations" that these happy invalids must pick their own grapes, and, as their appetites rapidly increase, it is no doubt a fact that they owe, in part, their recoveries, which are generally certain, to the almost constant sunlight and the invigorating mountain air in which they pass their waking hours.

Grape-cures, or almost any kind of fruit-cures, might be established in our own gardens and on our own hillsides. The prescription is a very simple one; enough of sound, ripe fruit (eaten at regular intervals) to satisfy hunger, the fruit to be picked by the invalids themselves, thus insuring pure air, sunlight, and mild exercise. The grape is one of the best and purest of tonics, and eaten, as it is in such instances, almost exclusively, a cleansed and purified system is the result, with all its happy manifestations in brightened eyes, clear and ruddy complexions, tranquil nerves, and active mental and physical powers.

Cultivation.—The grape-vine is raised from cuttings, or from layers. As to the first, you cut off, as early as the ground is open in the spring, a piece of the last year's wood; that is to say, a piece of a shoot, which grew during the last summer. This cutting should, if convenient, have an inch or two of the former year's wood at the bottom of it; but this is by no means absolutely necessary. The cutting should have four or

five buds or joints. Make the ground rich, move it deep, and make it fine. Then put in the cutting with a setting-stick, leaving only two buds, or joints, above ground; keeping it cool and moist. Layers from grape-vines are obtained with great ease. You have only to lay a shoot, or limb, however young or old, upon the ground, and cover any part of it with earth, it will strike roots the first summer, and will become a vine, to be carried and planted in any other place. But, observe, vines do not transplant well. For this reason, both cuttings and layers, if intended to be removed, are usually set, or layed, in flower pots, out of which they are turned, with the ball of earth along with them, into the earth where they are intended to grow and produce their fruit.

Soil.—Any good soil, well drained, artificially, if not so in its own formation, and in a fair exposure, from a stiff clay to almost a drifting sand, will produce the grape of approved varieties (when they are such as will ripen between its spring and autumn frosts,) in perfection. In culture they are not difficult, needing only to be kept free from weeds and other herbage, properly trained on stakes, or trellises, and well pruned.

Peach.—Soil.—A light, warm, sandy or gravelly loam, in a sunny exposure, protected from severe bleak winds. Thus situated, and in favorable latitudes, it often flourishes in luxuriance, and produces the most luscious fruit. In portions of western New York, and on the southern borders of Lake Erie, and the east shore of Lake Michigan, south of latitude 42 °, the peach grows more vigorously, and lives longer, than in any other sections of the United States, frequently lasting twenty or thirty years, and bearing constantly and in abundance. Peaches are produced in immense quantities in the State of New Jersey and Delaware, on the light soils near the Atlantic coast, for the large city markets, and in those states the crop of a single proprietor often amounts to $5,000, and sometimes exceeds $20,000, annually. None but the choicest kinds are cultivated, and these are inoculated into the seedling when a year old. They are transplanted at two and three, and are worn out, cut down and burned at the age of from six to twelve years. The proper distance at which they should be

planted is sixteen to twenty feet apart, according to situation, soil and exposure. Constant cultivation of the ground, without cropping, is necessary for their best growth and bearing.

Diseases.—It is liable to many diseases and to the depredations of numerous enemies. The yellows is the most fatal disease, and this can only be checked by the immediate removal of the diseased tree from the orchard. Of the insects, the grub or peach worm is the most destructive. It punctures the bark, and lays its egg beneath it at the surface of the earth, and when discovered it should be killed with a penknife or pointed wire. A good preventitive is to form a cone of earth a foot high around the trunk about the first of June; or if made of leached ashes it would be better. Remove this heap in October, and the bark will harden below the reach of the fly the following year.

Pear.—Pears are grafted on pear-stocks, on quince-stocks, or on those of white-thorn. The last is best, because most durable, and, for dwarf trees, much the best, because they do not throw up wood so big and so lofty. For orchards, pear-stock are best; but not from suckers on any account. They are sure to fill the orchard with suckers. The pruning for your pear trees in the garden should be that of the peach. The pears will grow higher; but they may be made to spread at bottom, and that will keep them from towering too much.

Diseases.—The pear is seldom subject to more than one formidable disease, the fire blight, and to this some localities are more subject than others. The disease manifests itself generally in midsummer, in the sudden withering of the leaves on one or more branches. The only effectual remedy is to cut off and burn the diseased limb immediately on its discovery. The causes are imperfectly known, but it has been variously ascribed to the presence of minute insects, to the abundant flow of sap, and to the severity of winter, yet with an entire uncertainty of any truth in the supposition.

Raspberry.—They are raised from suckers, though they may be raised from cuttings. The suckers of this year are planted out in rows, six feet apart, and the plants two feet apart in rows. This is done in the fall, or early in the spring.

At the time of planting they should be cut down to within a foot of the ground. They will bear a little, and they will send out several suckers which will bear the next year. About four are enough to leave, and those of the strongest. These should be cut off in the fall, or early in the spring, to within four feet of the ground, and should be tied to a small stake. A straight branch of locust is best, and then the stake lasts a life-time at least, let the life be as long as it may. The next year more suckers come up, which are treated in the same way. Fifty clumps are enough, if well managed. There are white and red; some like one best and some the other. To have them fine, you must dig in manure in the autumn, and keep the ground clean during the summer by hoeing.

Strawberry.—They are propagated from young plants that grow out of the old ones. In the summer the plant sends forth runners. Where these touch the ground, at a certain distance from the plant, come roots, and from these roots a plant springs up. This plant is put out early in the fall. It takes root before winter; and the next year it will bear a little; and send out runners of its own. To make a strawberry bed, plant three rows a foot apart, and at eight inches apart in the rows. Keep the ground clean, and the new plants, coming from runners, will fill up the whole of the ground, and will extend the bed on the sides. Cut off the runners at six inches distance from the sides, and then you have a bed three feet wide, covering all the ground, and this is the best way, for the fruit then lodges on the stems and leaves, and is not beaten into the dirt by heavy rains, which it is if the plants stand in clumps with clear ground between them.

Cranberries.—They are generally planted on low, moist meadows, which are prepared by thoroughly taking out all aquatic or other shrubs or trees, filling it with gravel where needing it, and plowing and harrowing. They are then set in drills by slips and roots, usually in the spring, but sometimes in autumn, about twenty inches apart, and at distances of about three inches. They require to have the weeds kept out and the ground stirred with a light cultivator or hoe, and they will soon overrun and occupy the whole ground. An occasional

top dressing of swamp muck is beneficial. Cultivators have in this way produced at the rate of three hundred bushels per acre, which were worth in the market from two to four dollars per bushel.

An Ice House.—Select or make a level space of ground near the house, where least exposed to the summer sun, and cover it with any kind of cheap boarding; leave spaces between the boards for drainage. Place stout posts at each corner, the two at the front being two feet higher than those at the back to support the slanting roof. Nail rough boards all round to the height of two and a half feet, and then nail similar ones on the inside; fill up this space on all sides with sawdust or tan-bark, and cover the floor to the depth of ten inches with the same. Select a freezing day, when the ice is in its best condition for storing this summer luxury. Have the ice cut in as large squares as can be handled, and pack it as closely and evenly as possible, filling up all gaps with pounded ice, and turning water over each layer. Nail on more boards when the space is filled, and put in more layers of ice until enough is stored for a summer's use, then cover the top two feet deep with the tan or sawdust, and build over it a roof of boards covered with slabs. When ice is removed from it, care must be taken to replace the covering as completely as possible.

Refrigerator.—A good refrigerator from the shops costs anywhere from $18 to $50, according to the size and finish. Every house-keeper may not be able to possess one, and so it is worth while to see what can be done in the way of a decent subsitute. Secure two dry-goods boxes, the more substantial the better, one of them to be three or four inches smaller than the other on all sides, and fix the tops to open on hinges of iron, or stout leather. The larger the boxes, of course, the more convenience and comfort is afforded. Place an inch or two of sawdust over the bottom of the larger box, and set the smaller one into it. Bore three-quarter inch holes through both boxes, at either end, near the top, and insert a roll of stiff pasteboard in each to act as ventilators. Then fill in all the space between the boxes with sawdust. Put in shelves at either end, leaving space in the center for the large deep pan

or pail that is to hold the ice. There can also be two or three pegs on which to hang pails of milk or fruit. A large tin pail, with a thin round board at the bottom to prevent its being bruised, would be the most convenient thing for holding the ice. Such a refrigerator, placed in the pantry, or some cool room, and covered in the hottest days with a folded blanket over the top, which is not protected with sawdust, would keep ice for twenty-four hours; and, in half a dozen such days, pay for its slight cost many times over in the amount of food it would help to preserve.

A Water Filter.—Serious sickness would often be averted from the household if, among other sanitary regulations, none but filtered water was drank by its members.

A good and efficient filter can be made in this way: Take a cask, remove one end and set it upright, the open end at the top. At one-third of the distance from the bottom place a round partition, pierced with small holes. On this arrange a layer of clean, small pebbles, and over them a layer of charcoal and another of sand, topping it over with more pebbles. Over this put another partition with holes in it, or a layer of good-sized stones, to prevent the pebbles from being disturbed when water is poured in. A faucet is to be placed in the bottom to draw off the water. A pail of water and a lump of ice, placed in the top of the cask and closely covered, supplies the perfection of drinking water for twenty-four hours.

Grapes and Pears for the Holidays.—Select the choicest and soundest specimens, and lay them on shelves in a cool, dark, and well ventilated closet, or darkened upper room, where there will be no danger of freezing, and where they can have plenty of space so as not to touch each other. Clusters of grapes should have the ends of their stems dipped in melted wax, and will keep best if hung up on slats, to prevent any contact with the wall. Choice fall apples and pears, that otherwise might not appear at Christmas, should be wiped and placed on white paper. The cooler the room is, without freezing, the better the fruit will keep; and good ventilation is strictly necessary. The Concords, Isabellas, and other late-ripening grapes, are excellent for such storing, and when frez-

ing weather arrives can be packed in sawdust, and kept nearly all winter.

The Garden.—The ground should be nearly on a level as possible, because, if the slope be considerable, the heavy rains do great injury by washing away the soil. However, it is not always in our power to choose a level spot; but, if there be a slope in the ground, it ought, if possible, to be towards the south. For, though such a direction adds to the heat in summer, this is more than counterbalanced by the earliness which it causes in the spring. By all means avoid an inclination towards the north, or west, and towards any of the points between north and west.

From a kitchen garden all large trees ought to be kept at a distance of thirty or forty yards. For the shade of them is injurious, and their roots a great deal more injurious, to every plant growing within the influence of those roots. Grass, which matts the ground all over with its roots, and does not demand much food from any depth, does not suffer much from the roots of trees; but every other plant does. A kitchen garden should, therefore, have no large trees near it. In the spring and fall tall trees do great harm even by their shade, which robs the garden of the early and the parting rays of the sun. It is, therefore, on all accounts, desirable to keep all such trees at a distance.

If it be practicable, make a garden near to running water, and especially to water that may be turned into the garden, the advantage ought to be profited of ; but, as to watering with a watering pot, it is seldom of much use, and it cannot be practiced upon a large scale. It is better to trust to judicious tillage and to the dews and rains. The moisture which these do not supply cannot be furnished, to any extent, by the watering pot. A man will raise more moisture with a hoe or spade, in a day, than he can pour on the earth out of a watering pot in a month.

Soil.—The plants, which grow in a garden, prefer the best soil that is to be found. The best is loam of several feet deep with a bed of lime-stone, sand-stone, or sand, below. But we must take what we find, or, rather, what we happen to have. If we have a choice, we ought to take that which comes nearest to

perfection, and, if we possibly can, we ought to reject clay and gravel, not only as a top soil, but as a bottom soil, however great their distance from the surface.

Oak trees love clay, and the finest and heaviest wheat grows in land with a bottom of clay; but if there be clay within even six feet of the surface, there will be a coldness in the land, which will, in spite of all you can do, keep your spring crops a week or ten days behind those upon land which has not a bottom of clay.

If the land, where you like to have a garden, has rocks, great or small, they, of course, are to be carried off; but, if you have a stony soil, that is to say, little short of gravel to the very surface, and, if you can get no other spot, you must e'en hammer your tools to pieces amongst the stones; for it has been amply proved by experience that to carry away stones of the flint or gravel kind impoverishes the land.

Having fixed upon the spot for the garden, the next thing is to prepare the ground. This may be done by ploughing and harrowing, until the ground at top be perfectly clean; and then by double ploughing; that is to say, by going with a strong plough that turns a large furrow and turns it cleanly, twice in the same place, and thus moving the ground to the depth of fourteen to sixteen inches, for the advantage of deeply moving the ground is very great indeed. When this has been done in one direction, it ought to be done across, and then the ground will have been well and truly moved. The ploughing ought to be done with four oxen, and the plough ought to be held by a strong and careful ploughman.

But this is not all that ought to be done, and it is proper to give directions for the best way of doing this and every thing else. The best way is then to trench the ground, which is performed in this manner: At one end of the piece of ground, intended for the garden, you make with a spade a trench all along, two feet wide and two feet deep. You throw the earth out on the side away from the garden that is to be. You shovel out the bottom clean, and make the sides of the trench as nearly perpendicular as possible. Thus you have a clean, open trench, running all along one end of your garden ground. You then take another piece all along, two feet wide,

and put the earth that this new piece contains into the trench, taking off the top of the new two feet wide, and turning that top down into the bottom of the trench, and then taking the remainder of the earth of the new two feet, and placing it on the top of the earth just turned into the bottom of the trench. Thus, when you have again shoveled out the bottom, and put it on the top of the whole that you have put into the trench, you have another clean trench two feet wide and two feet deep. You thus proceed till the whole of the garden ground be trenched; and then it will have been cleanly turned over to the depth of two feet.

As to the expense of this preparatory operation, a man that knows how to use a spade will trench four rods in a day very easily in the month of October, or in the month of November if the ground be not frozen. Supposing the garden to contain an acre, and the laborer to earn a dollar a day, the cost of this operation will, of course, be forty dollars; which, perhaps, would be twenty dollars above the expense of the various ploughings and harrowings necessary in the other way; but the difference in the value of the two operations is beyond all calculation. There is no point of greater importance than this. Poor ground deeply moved is preferable, in many cases, to rich ground with shallow tillage; and, when the ground has been deeply moved once, it feels the benefit for ever after. A garden is made to last for ages; what, then, in such a case, is the amount of twenty dollars? It is well known, to all who have had experience on the subject, that of two plants of almost any kind that stand for the space of three months in top soil of the same quality, one being on ground deeply moved, and the other on ground moved no deeper than is usual, the former will exceed the latter one-half in bulk. And, as to trees of all descriptions, from the pear tree down to the currant bush, the difference is so great that there is no room room for comparison. It is a notion with some persons that it is of no use to move the ground deeper than the roots of the plant penetrate. But, in the first place, the roots go much deeper than we generally suppose. When we pull up a cabbage, for instance, we see no roots more than a foot long; but, if we were careful to pursue the roots to their utmost point,

even as far as our eye would assist us, we should find the roots a great deal longer, and the extremities of the roots are much too fine to be seen by the naked eye. Upon pulling up a common turnip, who would imagine that the side, or horizontal roots, extend to several feet?

It is, therefore, of the greatest importance that the ground be moved to a good depth, and he who is about to make a garden should remember that he is about to do that, the effects of which are to be felt for ages. There is, however, one objection to trenching in certain cases. The soil may not only not be good to the depth of two feet, but it may be bad long before you come to that depth, and, in this case, the trenching, in putting the good soil at bottom, might bring a hungry sand, or even a gravel or clay, to the top, which must not be done by any means; for, even in the case of trees, they would perish, or become stunted, because their roots would not find their way from the bad soil to the good.

The ground being trenched, in October, ought to be well manured at top with good, well-rotted dung, or with soap-boilers' ashes, or some other good manure; and this might be ploughed or dug in shallowly. Before the frost is gone in the spring, another good coat of manure should be put on; well-rotted manure from the yard; ashes, or, rather, if ready, from a good compost. Then, when the frost is gone, the ground will be instantly fit for digging and planting; and it will bear almost any thing that can be put into it.

A Hot Bed.—If it can be so arranged, it should be built against a shed or board fence, with its face to the south-east or to the south. Horse manure is the best to use for this purpose. Make a frame of boards or plank as large as desired, and a foot and a half higher at the back than in front, so as to furnish a slanting support for the glass to rest upon. It should be two feet high in front. Place the manure in the bottom to the depth of a foot and a half. It should be well fermented and warm. Over it spread a few inches of good garden soil, in which is a fair mixture of sand. Cover the bed with the window sash and let the sun blaze in upon it through two or three bright days, having taken the precaution to bank the bed on the outside with soil and manure. Plant the seeds in rows with

labeled sticks between each kind. Sprinkle over warm water with a rose-sprinkler, and adjust the sashes. Give the bed fresh air at noon every fair day, and see that the young plants do not suffer for water.

When the plants come up tney will soon tell you all about air; for, if they have not enough, they will draw up long-legged, and will have small seed leaves, and, indeed, if too much deprived of air, will droop down and die. Take care in time to prevent this. Let them grow strong rather than tall. Short stems, broad seed leaves, very green; these are the signs of good plants and proper management.

It will be necessary to water. Take off a light at a time, and water with a watering pot that does not pour out heavily. Water just about sun-set; and then shut down the lights; and the heat will then rise, and make the plants grow prodigiously.

Saving and Preserving Seed.—This is the most important branch of the gardener's business.

As to the saving of seed, the truest plants should be selected; that is to say, such as one of the most perfect shape and quality. In the cabbage, seek small stem, well formed loaf, few spare or loose leaves; in the turnip, large bulk, small neck, slender stalked leaves, solid flesh or pulp; in the radish, high color, (if red or scarlet,) small neck, few and short leaves and long top, the marks of perfection are well known and none but perfect plants should be saved for seed. The case is somewhat different as to plants, which are some male and others female.

Of plants, the early coming of which is a circumstance of importance, the very earliest should be chosen for seed; for they will almost always be found to include the highest degree of perfection in other respects.

They should stand till perfectly ripe, if possible. They should be cut, or pulled, or gathered, when it is dry; and they should, if possible, be dry as dry can be before they are threshed out. If, when threshed, any moisture remains about them, they should be placed in the sun, or near a fire in a dry room, and when quite dry should be put into bags and hung up against a very dry wall, or boards, where they will by

no accident get damp. The best place is some room, or place, where there is occasionally, at least a fire kept in winter.

Thus preserved, kept from open air and from damp, the seeds of vegetables will keep sound and good for sowing for the number of years stated in the following list, to which the reader will particularly attend. Some of the seeds in this list will keep, sometimes, a year longer, if very well saved and very well preserved, and especially if closely kept from exposure to the open air. But, to lose a crop from unsoundness of seed is a sad thing, and it is, indeed, negligence wholly inexcusable to sow seed of the soundness of which we are not certain.

	Years.
Asparagus	4
Bean	1
Bean (Kidney)	1
Beet	10
Burnet	6
Cabbage	4
Camomile	2
Capsicum	2
Caraway	4
Carrot	1
Cauliflower	4
Celery	10
Marigold	3
Melon	10
Mint	4
Mustard	4
Onion	2
Parsley	6
Parsnip	1
Pea	1
Pennyroyal	2
Potato	3
Pumpkin	10
Purslane	2
Radish	2
Rape	4
Rhubarb	1
Rosemary	3

	Years.
Corn	3
Corn Salad	2
Cress	2
Cucumber	10
Dandelion	10
Dock	1
Fennel	5
Garlick	3
Gourd	10
Hop	2
Horse-Radish	4
Hyssop	6
Jerusalem Artichoke	3
Lavender	2
Leek	2
Lettuce	3
Mangle Wurzel	10
Ruta-Baga	4
Savory	2
Sorrel	7
Spinach	4
Squash	10
Tansey	3
Thyme	2
Tomatum	2
Turnip	4
Wormwood	2

Sowing.—The first thing relating to sowing is the preparation of the ground. It may be more or less fine according to the sort of seed to be sown. Peas and beans do not, of course, require the earth so fine as small seeds do. But, still the finer the better for everything; for it is best if the seed be actually pressed by the earth in every part; and many seeds, if not all, are best situated when the earth is trodden down upon them.

Never sow when the ground is wet; nor, indeed, if it can be avoided, perform any other act with or on the ground of a garden. It is even desirable that wet should not come for some days after ground has been moved; for, if the wet come before the ground be dry at the top, the earth will run to-

gether, and will become bound at top. Sow, therefore, if possible, in dry weather, but in freshly moved ground.

The season for sowing differs, of course, with the respective plants.

However, it is necessary to observe that some, and even many, things, which are usually sown in the spring, would be better sown in the fall; and especially when we consider how little time there is for doing all things in the spring. Parsnips, carrots, beets, onions, and many other things, may be safely sown in the fall. The seed will not perish if covered by the earth. But, then, care must be taken to sow early enough in the fall for the plants to come up before the frost sets in. The seed of all plants will lie safe in this way all the winter, though the frost penetrate to the distance of three feet beneath them, except the seeds of such plants as a slight frost will cut down. The seed of kidney beans, for instance, will rot, if the ground be not warm enough to bring it up. So will the seeds of cucumbers, melons, and Indian corn, unless buried beyond the reach of the influence of the atmosphere.

Transplanting.—The weather for transplanting, whether of table vegetables, or of trees, is the same as that for sowing. If you do this work in wet weather, or when the ground is wet, the work cannot be well done. It is no matter what the plant is, whether it be a cucumber plant, or an oak tree. It has been observed, as to seeds, that they like the earth to touch them in every part, and to lie close about them. It is the same with roots. One half of the bad growth that we see in orchards arises from negligence in planting; from tumbling the earth carelessly in upon the roots. The earth should be fine as possible; for, if it be not, part of the roots will remain untouched by the earth. If ground be wet, it cannot be fine.

If possible, therefore, transplant when the ground is not wet; but, here again, as in the case of sowing, let it be dug or deeply moved, and well broken, immediately before you transplant into it.

If you transplant in hot weather, the leaves of the plants will be scorched; but the hearts will live; and the heat, assisting the fermentation, will produce new roots in twenty-four

hours, and new leaves in a few days. Then it is that you see fine vegetation come on.

Cultivation.—If the subject be from seed, the first thing is to see that the plants stand at a proper distance from each other; because, if left too close, they cannot come to good. Let them also be thinned early; for, even while in seed leaf, they injure each other. Carrots, parsnips, lettuces, everything ought to be thinned in the seed leaf.

Hoe, or weed, immediately; weeds never ought to be suffered to get any size, either in field or garden, and especially in the latter.

But, besides the act of killing weeds, cultivation means moving the earth between the plants while growing. This assists them in their growth; it feeds them; it raises food for their roots to live upon. A mere flat hoeing does nothing but keep down the weeds. The hoeing, when the plants are become stout, should be deep. Deep hoeing is enough in some cases, but in others, digging is necessary to produce a fine and full crop. If anybody will have a piece of cabbages, and will dig between the rows of one half of them, twice during their growth, and let the other half of the piece have nothing but a flat hoeing, that person will find that the half which has been digged between, will, when the crop is ripe, weigh nearly, if not quite, twice as much as the other half. But, why need this be said in an Indian corn country, where it is so well known, that without being ploughed between, the corn will produce next to nothing?

It may appear that to dig thus amongst growing plants is to cut off, or tear off, their roots, of which the ground is full. This is really the case, and this does great good; for the roots thus cut asunder shoot again from the plant side, find new food, and send instantly fresh vigor to the plant. The effect of this tillage is quite surprising. We are hardly aware of its power of producing vegetation; and we are still less aware of the distance to which the roots of plants extend in every direction.

INJURIOUS INSECTS AND THE REMEDIES FOR THEM.

Colorado Potato Beetle.—The history of this beetle, that

it is a native of Colorado, where it was discovered, named and described, many years ago, is well known.

It comes forth out of the earth as a beetle just as the potato vines are peering from the ground. With the coming of warm days the female lays her cluster of orange eggs, sometimes to the number of a thousand, either on the under side of the leaves of the potato vines, or on the blades of grass or other vegetables near by.

These soon hatch, when the young, or larvæ, are found to eat quite as voraciously as the mature beetle. In about fifteen days the young become fully developed, when they pass into the ground to pupate. After about ten days of such quiet they come forth in the beetle state.

These beetles, with their bright bands of yellow and black, mate, deposit eggs, and soon die, behaving in all respects as before. So to, the larvæ and pupæ. These again are followed by a third brood, which completes the ruinous work of the season.

Remedies.—Inasmuch as Paris green is so practical, so efficient, and so cheap a remedy for this pest, every farmer better ignore all other means, such as hand picking, machinery, etc., as too expensive, and not sufficiently thorough. With a little care, Paris green, the genuine article, of course is entirely safe.

The two methods which have been tried with the best success as to economy are, either to mix the green with water, a heaping tablespoonful to ten quarts of the fluid, and sprinkle on with a common sprinkler, or an old broom; or to mix the green with flour in the proportion of one part of green to six of flour, sifted on when there is no dew on the vines, either through a muslin bag suspended to a convenient handle, that it may be carried and shaken over the vines, the person making the application walking upright, or with a pail, the bottom being of fine wire gauze, or finely perforated tin. Where these methods are used, the whole expense per acre, for both material and cost of application, will not exceed five dollars for the season.

The advantages of the water mixture are ease, safety, even with the careless, and rapidity of application, and that, too, even if the day is windy. Its disadvantages are waste of material, as nearly one-third of the water does not touch the vines, and, of course, are lost; danger of not stirring the mixture sufficiently often, when the green being only held in suspension, not dissolved, settles to the bottom, and the preparation becomes too dilute; ease with which the green when thus applied is washed off by heavy rains; and the danger of not applying evenly, as the powder suspended in the water is amassed

wherever the drops of water settle. Yet, from its convenience and the ease with which the application may be made, this will quite likely be the favorite method.

The flour mixture is preferable to all other preparations. The flour makes the green adhere to the vines so that the heaviest rain is powerless to remove it. No second application is needed till enlarged growth of vines demands it. Make the mixture strong, one of powder to six of flour. The danger of using the flour mixture consists in the fact that unless used sparingly, the paste will destroy the vines. But it is perfectly easy and entirely safe to use it if the least possible amount be used. Add only enough that it may be seen.

Some prefer to use plaster instead of flour, using forty or fifty parts of plaster by measure to one of the green. This does not form a paste, and can be added in quantity without danger to the vines—indeed the plaster may be useful—but the first heavy rain will wash it off.

Cut-Worms.—Little, if any, inferior to the potato beetle in its destruction to our field crops, is the cut-worm. The cut-worms (for there are several species which claim tribute from the grain grower,) are not confined in their operations to a single staple, for nearly all our cereals, grasses, and especially our corn crops, are made to contribute to their support.

The cut-worms are so named from their prodigal habits of cutting off plants; not taking their fill on a single plant, leaving all uneaten undisturbed; but, as if totally depraved, they simply cut the plants asunder, thus ruining every plant that they attack.

The young cut-worms, perhaps from their small size and abundant food, seem to attract little attention because of their injuries till the succeeding May, when the full grown larvæ, not over an inch in length, greasy, and in sober garb of gray, brown, or striped with light and dark, depending on the species, come forth to nip our crops and blast our hopes.

Remedies.—There is no more sure way to ward off cut-worm injuries than to enter into partnership with the birds, in which it shall be the duty of the party of the first part to plow the land early in the fall, so that bluebird, robin, and grakle may have a cut-worm feast before leaving for more genial climes. Deep harrowing will aid the party of the second part, while a repetition of the same, as early in the spring as the season will permit, will insure a thanksgiving repast of the same nature.

Early spring birds are much put to it to gain sufficient food

for themselves and brood, and with the opportunity will become chief abettors in cut-worm destruction.

The only method to supplement the above measures when they are not adequate to remove the evil, with our field crops, is digging out by hand and destroying. This is by no means so tedious a procedure as would be thought at first, as, by passing along the cornfield early in the morning, the cut stock will reveal the whereabouts of the night-marauder, which, by digging around the stub, may soon be found and crushed.

The May Beetle.—Few farmers will need a description of that sleek old culprit, the white grub—still less to be assured of its destructive powers, as the damage to our meadows and other products are becoming yearly more alarming.

In May and June the beetles, all brown and plump, come forth from the ground, and at early twilight, and on into the night, fly forth in such numbers as to sound like the swarming of bees, often annoying us by thumping at windows or lumbering into our rooms, to be felled by bumping the walls; hence the name dor-beetle, and the expressions "beetle-headed" and "blind as a beetle." These beetles often do no inconsiderable damage by eating the foilage from fruit trees. Would that they might rest content with the completion of such mischief! After pairing, the females lay their eggs, fifty or more, probably in the ground, near the roots of grass or other plants.

The grub, white, wrinkled, with a brown head, feeds on the roots of grass, wheat, corn, and other plants, for three years, when it becomes full-grown, having attained nearly one and one-half inches in length. In the third autumn it forms a cocoon of earth, in which it pupates. The next May or June the beetles come forth to enjoy a brief riot, and prepare for another round of mischief under ground.

Remedies.—As the number of these beetles and grubs are frequently so alarmingly great, and their mischief so wide spread and extensive, we can only hope to ward off the ravages in our pastures and meadows by wholesale remedies. So soon as the meadow turns sear, and we have the further evidence that the white grub is the culprit in the grass, now rootless, freely yielding to the hand or rake; or, still better, finding the sleek old gormand beneath by a little digging; if this state of things is so extensive as to create uneasiness, the field better be given over at once to the swine, and the more swine the better. It may be as profitable to turn the grass into pork, indirectly through the aid of the white grub, as to change it directly into beef or mutton; besides, we then are sure to destroy a grievous pest. If the meadow is the seat of the evil, it may pay best to cut the hay first. Early fall plowing will

enable the birds to aid the swine, and possibly kill the grubs by destroying their food. Frequent harrowing will give the birds a still better chance.

In protecting wheat and corn, the same remedies would apply as those recommended to destroy the cut-worm.

Wire-Worm.—Within a few years these insects have become quite destructive.

Wire-worms, larvæ of elater, or spring beetles, usually feed on rotten wood, so that we can hardly raise a piece of bark on a decaying log, or turn over a rotten log, without finding them. Would that all were content with such a diet! but not so, for, as too many know by disheartening experience, some of them attack the newly planted potatoes in a perfectly ruinous manner, so that to have a crop demands a second planting. Nor do they behave better toward the fresh corn plants. These wire-worms are well named, as they much resemble in form both a worm and a wire. They have the six usual jointed legs, and thus may be easily told from the myriapods, which they somewhat resemble, but which have many legs. They work for several years and pupate in an earthen cocoon. The beetles which come from these grubs are the well known elaters, or spring beetles, which possess such a power of springing up, if perchance they fall on their back. This habit, less than their peculiar form, will serve to distinguish them wherever seen.

Remedies.—The same course as that recommended for cut-worms and the white grub—fall plowing and frequent harrowing, to give the fall and spring birds a good chance—will also serve here. In England, where they are greatly troubled with these same or similar insects, it is common to bury potatoes with a long stick stuck through them to mark their whereabouts. This is done early—some time before planting. The grubs collect on these to feed, when they are gathered and destroyed. Gas-lime and salt are also highly recommended by experienced gardeners in Europe. These are placed with the seed in planting.

Pea Weevil.—This little insect, though doing little damage to garden peas, for in green peas it is not only too small to essentially change the flavor, but even to attract the eye, but in field crops, where peas are raised to feed after they are fully matured, there is very serious injury, for this little weevil, so generally distributed, and so persistent in its yearly attacks, consumes, while yet a larvæ, all the nutritious material of the pea, leaving only the germ and a mere shell outside. Hence, affected peas will grow, but, of course, with bated vigor; as the needed starch pabulum is wanting in those early days, the

precarious time with all life; but to feed they are almost entirely useless.

REMEDIES.—As these insects are in the peas in the winter and in the spring, if the same be kept over one year, in perfectly close barrels, bags, cans, or bottles, of course, the insects thus confined will all die. Hence, if these pea weevils are sufficiently annoying to cause disturbance, there can be a most effectual estoppel put upon their mischief by thus putting all our peas in close vessels, any time in the winter, and keeping them close for one season.

The Squash Bug.—This old-time enemy is so well known that the name is all that is necessary to bring his image and evil doings to mind.

REMEDIES.—The habit that these squash bugs have of concealment suggests a very practical means to capture them. It is similar to the Ransom process for capturing the plum curculio, and consists simply in placing small pieces, boards, chips, or even green leaves, on the ground, close around the vines. We may then go around each morning, early in the season, before the eggs are laid, and gatner and destroy the bugs thus concealed, and soon extirpate the cause of the evil. These morning visits must be so early that the insects will not have yet left their hiding places. If the eggs are laid before we capture the bugs, we should either gather the eggs from beneath the leaves or continue the same process narrated above to get rid of the young.

Tomato Worm.—All who grow that beautiful and savory vegetable, the tomato, are acquainted with the formidable pest which, unless prevented, too often brings all hopes of satisfied tomato appetites to naught.

REMEDIES.—Hand-picking is a quick, easy and sure preventive. The only objection to this is that it is disagreeable and sometimes prevented by timidity. Yet a good pair of gloves will insure the temerity necessary to its successful practice. As before intimated, the fear is entirely groundless, for there are no more harmless creatures in existence. To be sure, they can give quite a pinch with their strong jaws, which they will attempt to do if held, but this is almost painless and entirely harmless. They never use their caudal horn, the supposed weapon of immemorial dread. So hand-picking, with or without gloves, is entirely safe, and as effectual as safe. Of course, the disfigured leaves will guide us in our search.

Skunks are powerful aids in this fight, as they feed extensively on the pupæ.

Cabbage Cut-Worms.—The larvæ generally lie concealed by day just beneath the soil, and come forth, cloaked in darkness, to do their evil work. This is not strictly true, as frequently on cloudy days their eager appetites, or else an innate longing for destruction (for these cut-worms do seem the most totally depraved of all insects), impel them forth to work havoc.

Sandy gardens, and those near meadows, pastures or lawns, where the insects have commenced, and nearly completed, their growth by feeding on the grass, or its roots, are by far the most liable to attack.

Remedies.—After the ground is well fitted for the plants, great advantage will result from placing newly mown grass, fresh cornstalks, etc., in heaps about the plat. Coming to these by night, the larvæ will feed and crawl beneath, and may be captured and destroyed every morning.

Sized paper, such as we usually write on, wound closely about the plants, and held in place by banking slightly about the base with earth, is a sure preventive, as the larvæ cannot pass up its smooth surface. Care is only necessary that the paper may closely encircle the plant, and that the banking be so efficient as to surely hold it in place.

The Striped Cucumber Beetle.—This beautiful little beetle, yellow with black stripes, which seems suddenly to fairly swarm on the cucumber and melon vines, is often the cause of great vexation to the gardener.

Remedies.—Boxes covered with glass, or millinet, and placed over the vines, are sure protection, providing the beetles do not get inside. If glass is used, care must be taken to shade from the hot sunshine, or the plants may be ruined. These will form miniature hot-beds, and will hasten growth if rightly managed.

Paris green is a certain preventive, and, in careful hands, is harmless to the vines. Put one part green to six parts flour, apply when the vines are dry, and add just as little as possible and see it on the vines. Add a little too much, and the vines are sure to be killed.

The Codling Moth.—All will concede that this insect holds first rank among our insect pests.

The little gray moths come forth in May and June, are wholly nocturnal, and, therefore, seldom seen. As soon as the fruit forms, a single egg is laid on the blossom end of the fruit, and as soon as the egg hatches the larvæ enters the apple. All know the subsequent history of the larvæ in the fruit, for who has not seen the tiny white caterpillar, with its black head, mining away at the rich pulp, which it replaces with filth?

Remedies.—Place around the trunk of every bearing tree, midway between the ground and branches, a woolen cloth about five inches wide and sufficiently long to pass around and lap enough to tack. This may be fastened with one or two tacks. Usually one placed in the middle is quite sufficient. The tack should not be driven quite up to the head. Before the cloth band is adjusted the loose bark should be scraped off. This may be done early in the season, when time will first permit. The band should be adjusted by June 20. Under the bands the "worm" will secrete themselves. By July 7 the bands around the earliest apple trees should be unwound and examined and the larvæ destroyed. This can be done by passing the bands through a wringer, or by unwinding and crushing with the thumb. Every ten days after the first round —every nine days if the weather is dry and warm—this work should be repeated, till the last week of August, and again at the close of the season after the fruit is gathered. A common carpet-tack hammer, with a good claw, suspended around the neck by a cord, will be found an advantage.

Many apples will be carried to the cellar with the larvæ still in them. These larvæ, unless destroyed, will go through their changes. Hence all barrels, bins and boxes in the cellar should be examined. Fires and jars of sweetened water will have no effect in destroying these moths. Hogs turned into the orchard are but a partial remedy, as at least half of the larvæ never go the ground at all.

Old Apple Tree Borer.—This pest, which has been so long in our country, is widely distributed. Very few, if any, orchards are exempt from its attacks. Not that it always or generally, totally destroys the trees; still, those suffering from its attacks are always lessened in vitality, and it not unfrequently happens that the trunks become so riddled with their tunnels that the tree becomes a prey to the hard winds which are sure to come with each returning year.

Remedies.—Soapy mixtures are found to be obnoxious to these beetles, so that in their egg-laying they are found to avoid trees to which such an application has been made. Thus we may hope to escape all danger by washing the smooth trunks of our trees early in June, and again early in July, with soft soap or a very strong solution of the same.

We should always examine the trees carefully in September, and, whenever we find this pernicious grub's sawdust shingle out, we should give him a call. Perhaps we may reach him with a wire thrust into the hole, and, by a vigorous ramming, crush the culprit. If we have doubts as to the crushing, we should follow him with a knife; but, in cutting out the borers, too great care cannot be taken to wound the tree just as little

as possible. This heroic method is sure, and requires very little time, and no person who takes pride in his orchard, or looks to it as a source of profit, can afford to neglect the September examination, nor the previous application of soap to which it is supplementary.

Canker Worm.—REMEDIES.—The old method so long practiced in New England is to closely surround the tree with paper bands, say eight inches wide, and besmear the bands with tar or printer's ink. This gives the trees a forbidding appearance, and necessitates renewed application of the adhesive substances so frequently as to be sure that we entrap the moth as she attempts to pass up the tree. Dr. Le Baron suggests a neater and, he says, an effectual remedy. He would place an inch rope closely around the tree, letting it lap a little so as to be sure to entirely surround the tree. Then tack the rope to the tree at each end. Now take a strip of tin, say five inches wide, place it around over the rope so that the rope shall be just in the middle of the tin; lap this a little and tack to the rope. It is said that the female moths, coming up to the rope, and being unable to crawl through under the tin, will crawl around and get on to the tin, but that they will never get from the tin to the tree again. Upon reaching the top of the tin they pass round and round, not knowing that they can pass down and thus gain the desired end. Like turkeys entrapped in a pen, whose exit is only through a hole beneath the earth's level, they are balked through sheer stupidity. In this case the moths will doubtless lay eggs around and below the tins. These can be destroyed by using kerosene oil. This turned upon the eggs destroys them. Eggs laid in close proximity to the trees, or wherever seen, can be destroyed in the same way.

If the moths once gain access to the tree, and the larvæ commence their work of despoliation, we can take advantage of their dropping propensity and destroy them. Place a little straw under the tree, not sufficient to injure it when burned. Then jar the tree, and, as the larvæ swing down by their threads, bring them upon the straw by sweeping the threads with a pole, then set fire to the straw, and we are rid of the pests. The only trouble will be to be sure to make them drop. To be complete, this will need cautious pains. During the past year syringing the tree with a mixture of Paris green and water was tried with marked success in Illinois, and is highly recommended by those who used it.

Though the neighbors of people with affected orchards may take satisfaction in the prospect of a speedy leave-taking of this terrible scourge, still those who have orchards attacked will find that persistent effort in the line marked out above will be the price of their orchards, as two or three years at most will utterly ruin the trees.

Plum Curculio.—This little beetle, though so small, certainly ranks very high as an orchard pest. It is he that ruins our cherries, often by wholesale. It is he that has a tooth for luscious peach; and, unless prevented, materially lessens the profits. And even our king of fruits, the apple, is frequently made to contribute to the support of the little Turk.

REMEDIES.—Of late the Ransom process has been largely practiced, and has given great satisfaction. It takes advantage of the habit of the insect, early in the season to hide by day, and consists in keeping the ground beneath and around the trees perfectly clean, and so thoroughly cultivated that it will be perfectly smooth, and placing chips or boards on the ground close about the tree. Mr. Ransom preferred oak bark; pieces of shingles would do. If bark is used, the outside should be placed up, and, whatever is used, the lower side should be entirely smooth. Three pieces, each the size of the hand, will be quite sufficient for each tree, and may be placed equally distant from each other, close about the base of the trunk. Early in May the bettles will commence to hide under these pieces. So soon as they are found to collect they should be gathered daily, and thence on so long as they are found, even to July.

Later in the season, it will be remembered, the insects do not go down to hide. Yet Mr. Ransom claims that the chip trap can still be made effectual, and cheaper than any other plan, by the following additional labor: Early in the day, pass through the orchard with a mallet, and give each bearing tree a smart blow. This will cause the insects to drop to the ground, when they will hide as before, and can be gathered into the bottles as before. The taking the insects from under the chips should not be delayed too long.

Pear or Cherry Tree Slugs.—The destructive proclivities of these slimy "worms" are far too well known. Few insects are so easily overcome; so, with knowledge, vigilance, and promptness, we may expect to soon be rid of a grievous pest.

REMEDIES.—The slime of these insects makes them peculiarly susceptible to any application like ashes, road-dust (some deny that road-dust is effectual), or lime. Hence, throwing any of the above substances into the tree where these insects are at work is sure to check their ravages. Such treatment goes to the root of the matter by destroying the source of the evil.

Plant Lice.—All fruit men are familiar with plant lice, as hardly a plant but suffers from the attack of some species. Yet, doubtless owing to the many natural enemies, and notwithstanding their wonderfully prolific tendencies, they are

rarely very destructive. Sometimes they will attack a tree and seem to draw heavily upon its vitality, and the very next year not a single louse will be found on the tree.

REMEDIES.—Syringing the plants with tobacco water is sure destruction to these insects. If limbs of small trees are alone attacked, they may be dipped in the fluid. Whale oil soap solution, and even common soap-suds, are beneficial, while many gardeners think that frequent syringing with pure water is not without benefit.

It has been recommended to brush the eggs off of young trees and small plants in the spring with a hand-brush,—advice of doubtful practicability.

Bee-Keeping—SWARM.—Every prosperous swarm of bees must contain one queen, several thousand workers, and a portion of the year a few hundred, or even thousand, drones.

THE QUEEN.—The queen is the only perfect female bee in the colony, and hence the name of queen or mother bee. In form she is longer than either of the other species. She is usually of a dark color, except the under side of the abdomen, which bears somewhat on the golden shade. All her colors are bright and glossy, and she has but little of the down or hair seen on the drones or workers. Her wings are short, reaching a little more than half way back. Her posterior is more pointed and has the appearance of curving under more than that of the workers. She has a sting, but never uses it, except in combat with a rival queen.

The average age of the queen is about three years. None should be allowed to become older than that, as after that age they often become barren, or deposit eggs which produce only drones, and the colony soon wastes away without being replenished with worker broods.

Like the drone, the queen never goes to gather honey, her only duty being to deposit the eggs, both male and female. She is as dependent on the workers as they are upon her, and both are dependent upon the drones, notwithstanding they are the acknowledged idlers of the colony.

THE EGG.—In all well populated hives young broods may be found in different stages of development, every month in the year, with few exceptions. The queen carefully examines each cell by thrusting her head in, before depositing the egg, to see if it contains bee bread or honey, as she never uses a cell partly filled. If she finds the cell clear, she immediately curves her abdomen and inserts it. She remains but a second or two and then leaves the cell, when an egg about a sixteenth of an inch long may be seen attached to the base of the cell, usually a little to one side.

HATCHING.—The eggs remain unchanged for three or four days. They are then hatched, the bottom of each cell containing a small white worm, which floats in a whitish transparent fluid, which is deposited by the nursing bees, and by which it is probably nourished. It gradually enlarges until its two extremities touch, which forms a ring. It continues to increase during five or six days, until it occupies the whole breadth and nearly the length of the cell. The nursing bees now seal over the cell with a light brown cover. As soon as the larvæ is perfectly enclosed, it begins to line the cell by spinning around itself a silky cocoon. When this is finished it undergoes a great change, from the grub to the nymph or pupa state, and does not bear a vestige of its previous form. It has now attained its full growth, and the large amount of nutriment taken serves as a store for developing the perfect insect. The time required to raise a queen is three days in the egg, and five days as a worm, and on the sixteenth day she has attained the perfect state of a queen bee. The working bee comes forth perfected in twenty-one days from the time the egg is deposited. The drone takes twenty-four or twenty-five days.

WORKER BEE.—They constitute the mass of the colony, and upon them devolve all the labors of the hive. They gather the honey and pollen—the food for the young. They nurse and feed the young brood, and defend their house against invasion of enemies. The care which the workers bestow upon their nurslings is wonderful, and they manifest the most tender attachment for them. The slightest movement of these nurses approaching to administer to the young brood is sufficient to attract them to their food, which they devour voraciously, and it is unsparingly administered. After the cells have been sealed up they seem to cease from anything like attention, although, if the brood comb is meddled with, their utmost ire is kindled. Bees reared in the spring and early summer are shorter lived than those reared later in the season. Each worker is armed with a formidable sting, and, when disturbed, does not hesitate to use it. The extremity being barbed, the bee can rarely withdraw it, and in losing her sting she loses her life and dies in defending her home and sacred treasures.

DRONES.—They differ from the queen and worker in form and structure, and are of a darker color and less active. They have no proboscis for gathering honey ; no basket for pollen ; no sack for wax ; and no sting to defend themselves with. Yet without them the brood would soon become extinct. They are the males of the bee family, and, in the performance of the functions appointed to them, they invariably yield up their life. The duties devolving upon them are to accompany

the young queens upon their bridal tour. In the performance of the same their life becomes the sacrifice.

The Italian Bees.—These are conceded by all to be far superior to the black bee above described, although they do not differ essentially in conformation ; yet for profit and amiability are a great improvement. In color, they are a beautiful golden hue. The worker, when pure, has three distinct bands about the body ; the color and bands being the test of purity. The queens are more fertile and prolific, depositing their eggs earlier in the season ; swarm oftener and earlier when not interfered with ; protect themselves from robber bees and moths more effectually ; carry in more honey, gathering from the small variety of red clover and some other plants whose cells are so deep that the common bee cannot reach the nectar distilled in the bottom of the flower cups ; will not sting upon as slight provocation, and can be handled more easily. They are stronger and more hardy, and live longer, although performing more labor. They are also more industrious, often going to the fields in very unfavorable weather.

The Hive.—A good hive should possess the following points, viz : cheapness ; simplicity ; durability ; as good for winter as summer ; that the combs may be removed without injuring or irritating the bees ; that the bees may have free access to the surplus honey arrangement ; that the surplus honey may be removed without injuring or irritating the bees and be in a marketable condition ; that the bees may be able to store every ounce of honey they can collect ; completely ventilated that the bees may not suffocate, and thousands of them hang on the outside of the hive for air in a hot day ; that all the heat from the hive may enter the surplus honey boxes or chamber, to enable the bees to elaborate wax and make comb; that, in case the bees are carrying in honey very rapidly, one set of boxes may be raised and another set placed under them; that there be no place in the hive where the miller moth can conceal itself ; that there be no space between the top of the combs and bottom of the honey boxes, except a single quarter of an inch ; that the bees may enter the surplus honey boxes from any part of the hive without creeping through a hole in the honey board ; that all openings of the hive be guarded with a slide or button ; that the boxes be covered with a light cap to exclude the chilly air at night as well as the excessive heat of the noonday sun, with a ventilation at each end to be opened on hot days and allow a current of air to pass over the honey boxes, permitting the excessive heat of the hive to escape in summer, and in winter to carry off the moisture generated by the bees.

THE APIARY.—The next thing in importance is the location of the apiary. Select, if possible, a sheltered place, shaded somewhat by trees, with an eastern or southern aspect, where they can be easily seen or heard from the house during swarming season. As regards the distance between the stands, it should be as great as circumstances will admit—two feet being the nearest they should be placed.

STANDS FOR HIVES—Is a subject to which too much attention cannot be given. Placing them several feet above the ground makes an unnecessary labor for the bees returning weary and heavy laden, with barely strength to reach the hive, they alight upon the ground, and, if toward evening when cool and damp, often perish. Others have no projection from the entrance upon which to alight, but expect them to fly direct from the field into the hive without making a pause.

SWARMING.—The swarming season in this latitude sometimes commences as early as the 15th of May, and at other times as late as the 1st of July. It usually commences about ten or twenty days after white clover comes into bloom. As a general rule, bees swarm for lack of room or want of thorough ventilation inside the hive.

HIVING BEES.—It makes but little difference how they are put into the hives, provided they are all made to enter. One essential thing is to have your hive in readiness. The hives should be stored in a cool place, as bees will enter a cool hive much quicker than one that has stood in the hot sun all day. Place upon the ground, under the swarm cluster, the hive, with a large piece of board just in front of it, upon which the bees can be poured. If they are to be hived in a box hive, one side should be raised one inch by placing under the front corner two sticks or blocks to hold it up from the bottom board. If in a movable comb hive, raise the front, if on a movable bottom board; if not, raise the entrance as wide as possible. If the swarm has clustered on a small branch or limb, it may be cut off, if not detrimental to the tree, and brought down and the bees shaken off in front of the hive. A knowledge that a new home is found is at once apparent. If any large number linger around the entrance, nearly closing it, you can expedite their progress by gently disturbing them with a small twig. If gentle means do not induce them to enter in a reasonable time, and they seem obstinate, a little water sprinkled on them will facilitate operations. Too much water must not be used, or they will become so wet that they will not move at all. If you do not wish to cut the limb they cluster on, they may be shaken into a basket. In this event it is well to sprinkle the cluster with a pailful of cold water (ice water not objec-

tionable), which will cause them to cluster closer, and hardly one will leave the basket. If you get nearly all the bees the first effort, shaking the limb will prevent the remainder from alighting, and will turn their attention to those who have found a home, and are loudly calling them to come.

Loss of Queen.—Every bee-keeper should understand how to detect the loss of the queen. The following morning after a loss of this kind has occurred, and occasionally in the evening, the bees may be seen running to and fro in wild consternation. Towards the middle of the day the confusion will be less marked, but the next morning will be again enacted, and, after the third or fourth day, will cease entirely, and apparently they become reconciled to their fate. They continue their labors, although they do not manifest the energy or agility seen in a prosperous colony.

Wintering Bees.—More bees are lost by wintering than by all other troubles combined. To winter them successfully, each stock should contain a sufficient amount of honey, bee-bread, and bees. For out-door wintering, each hive should contain from 30 to 35 lbs. of honey; in-door, 5 to 10 lbs. less. Each hive should have an upward ventilation—it is absolutely necessary.

Diseases of Bees.—Bees are subject to but few diseases which deserve especial notice. There appear to be but two distinct types to which they are subject in this country, viz.: Dysentery and Foul Brood. The former of these generally makes its appearance in the spring, and may be known by the bees discharging their excrements over the comb, the interior of the hive, and especially around the entrance; the color, instead of being yellow, is of a dark muddy appearance, and has a sickening, offensive odor, which becomes intolerable. The cause may be ascribed to the moisture in the hive condensing and mixing with the honey in the cells. Colonies affected by dysentery are usually lost, unless warm weather timely intervenes or they are removed to a warm room, so that the water in the honey may be evaporated, which will generally terminate the trouble.

Foul Brood.—In the destruction of the nymph or pupæ from some derangement which causes it to undergo decomposition in the cell, arises a disease known as Foul Brood. Some say it is caused by the brood being chilled in the cell; others, that it is caused by the fermentation of bee-bread and honey. Some recommend that it be summarily dealt with, and the way to exterminate it entirely is to bury it, hive, bees and all, beyond any possibility of resurrection.

FEEDING BEES.—Few things in bee-keeping are more important, and require a more thorough knowledge, than the feeding of bees. In attempting to winter too small colonies, thousands often perish in winter and early spring. Colonies in the common box hive, containing few combs and but little honey, should be fed in the latter part of September, or in October, a sufficient amount to carry them safely through the winter. If feeding is neglected until winter, it may then be done by placing the hive in a cellar or moderately warm room.

In the spring the prudent bee-keeper will no more neglect to feed his destitute colonies than to provide for his own table. There is one point certain in bee-keeping: that, if a colony is stimulated carefully in the spring, they and their first swarm will have honey sufficient in the fall to winter them through, unless a very unfavorable season occurs. Water is indispensable to bees when building comb or raising brood. Every prudent bee-keeper will see that his bees are supplied with water, by placing shallow wooden troughs filled with straws or floats, that they may drink without danger of drowning. A location near small bodies of water will be sufficient for a supply, but locations near large bodies are injurious.

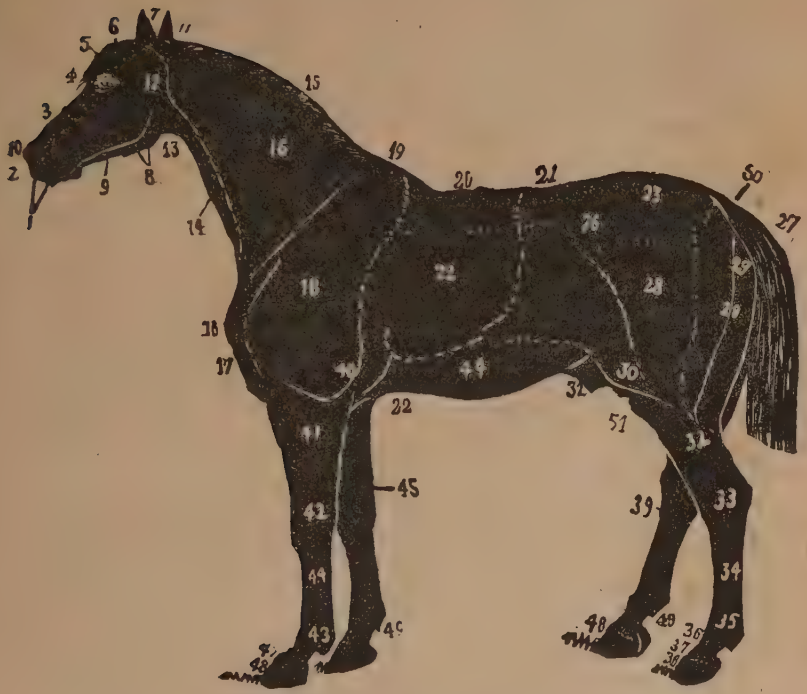
TRANSFERRING.—Transferring is changing a colony of bees and all the contents of a hive from one to another. It should be done in the spring or summer, to be successful. Transferring may be done at any time of the day, if pleasant. The best place to make the transfer is in some shaded locality or clean building. It will be necessary to have a few things in readiness, such as a box the size of the hive and a foot deep, for a driving-box; an axe, a saw, a large knife, some goose-quills, some twine, a dish of water to wash the honey from your hands, and a few dishes to put the honey and pieces of comb in; also some kind of bench should be arranged to lay the comb on.

The swarm to be treated should have tobacco smoke blown in among them to drive the bees among the comb, and also to subdue them. The hives should be removed to the place of transfer, placing another as near like it as possible on the old stand, that the returning bees may not join other hives and be killed. Invert the hive, and place over it the driving-box. Wrap a piece of cloth around where the two join, to prevent escape. Get two round sticks, fifteen inches long and one inch in diameter, and commence beating the hive a few minutes, then stop about five minutes to allow the bees to fill themselves with honey, then beat again for ten minutes, by which time nearly all will have left and clustered in the box. The sheet or cloth is then taken off, spread upon the ground, and the driving-box placed upon it, the same side up as before, and a

small stick placed under one side to allow the air to enter. Loosen the comb from two sides of the hive, and with an axe split the sides off, that the comb may be taken out whole. Lay the comb upon the table, and place over it the frame. Cut the comb a trifle larger than the frame, so it will fit closely, having it the same side up in the new hive that it was in the old. After the comb is fitted in it may be secured in its place by tying around the frame a piece of cotton twine. The bees will fasten it with wax in a day or two. Now hang the frame in the new hive. Do in the same manner until all good worker comb is secured, leaving out all drone comb. Now put in the bees, the same as hiving a natural swarm. Place upon the old stand, with the entrance contracted, and the ventilator left open during the heat of the day. In about two days the bees will have the comb fastened, when the strings can be cut and drawn out, and the boxes put on.

"A JUDICIAL BAYARD."

THE HORSE.



POINTS OF THE HORSE.

The above diagram represents the different points of the body of a horse, about some of which frequent errors are made.

1. Lips.
2. Muzzle.
3. Nose.
4. Forehead.
5. Hollow over eye.
6. Forelock.
7. Ears.
8. Branches of lower jaw.
9. Cheek.
10. Nostrils
11. Poll.
12. Parotid gland.
13. Larynx or Voice-box.
14. Left jugular vein.
15. Side of neck.
16. Mane.
17. Breast.
18. Shoulder.
18. Shoulder-point.
19. Withers.
20. Back.
21. Loins.
22. Side of chest.
23. Croup.
24. Abdomen or belly.
25. Flank.
26. Hip bone.
27. Tail.
28. Thigh.
29. Buttock.
30. Stifle joint.
31. Sheath.
31. Scrotum or purse.
32. Lower thigh (gassin.)
33. Hock.
34. Hind cannon bone and back tendons.
35. Hind fetlock joint.
36. Pastern.
37. Coronet
38. Hoof.
39. Hind chestnut.
40. Arm.
40. Elbow
41. Fore-arm
42. Knee.
43. Fore chestnut.
44. Fore cannon bone and back tendons.
45. Fore fetlock joint.
46. Fore pastern.
47. Fore coronet.
48. Fore hoof.
49. Fetlock, fore and hind.
50. Dock, covering anus.

In judging of the merits of a horse for the plow, the carriage, or the saddle, the characteristic indications of the head and adjacent parts are very important. There are, of course, numerous differences of conformation characteristic of different breeds rather than of merits or defects, but there are also certain beauties which should be sought for in all breeds. Of these, smallness of the head is one, for a small head is always preferable to a large one in the same breed. The eyes, too, should be large and wide open, indicative of good sight. A large forehead is a desirable beauty, and large, well opened nostrils show the nasal and respiratory organs are in good condition. The lips should be firm, not flabby, and the lower jaw should be set easily in the larynx to permit the head to move freely from the neck. The accompanying diagrams will illustrate various points in this connection.

The head is well set in a draft horse when it makes an angle of about 45 degrees with the horizon, as in Fig. 1, while for a saddle horse it should be more vertical, as in Fig. 2. When the head approaches the shoulders too closely, the defect is known by the name of rain-bow neck, as in Fig. 3. On the other hand, when the head is carried more horizonally, as in Fig. 4, the defect is greater, as the rider has less control of his horse, for the bit rests on his teeth, and there is danger of his "taking it between them." Fig. 5 illustrates a sheep-faced head, whose curved and prominent outline is found very frequently in pictures and sculptures of former days. The opposite of this is the flat-nosed head shown at Fig. 6, in which, instead of a concave curve between the nose and the brow, there is a depression. When the depression is in the middle of the nose, where the nose-band rests, the conformation is known as a rhinoceros head. Small ears set straight on the head and parallel to each other, are a beauty, while long, divergent ears, which hang more or less flabbily, are a defect, showing unsoundness and exhaustion. These, as shown at Fig. 8, are called pig's ears, and the bearer of them is lop-eared.

DRAFT HORSE'S HEAD, WELL SET. FIG. 1.

SADDLE HORSE'S HEAD. FIG. 2.

RAINBOW NECK. FIG. 3.

HEAD CARRIED HORIZONTALLY. FIG. 4.

SHEEP-FACED HEAD. FIG. 5.

FLAT-NOSE HEAD. FIG. 6.

RHINOCEROS HEAD. FIG. 7.

LOP-EARED. FIG. 8.

The color is not material, provided it be not pied or mealy. No better color for horses can be found than the dark bay or brown, with black mane, tail and legs. Chestnut is also an admirable color. But most of the other colors are frequently with the best horses. Hard-mouthed horses, when accompanied with great spirits, are objectionable, as they require peculiar bitting and the utmost vigilance. The paces and action of a horse are important, for, if good, they give a much greater capacity for performance. Some of these depend on form and structure, and are unchangeable; others are the result of breaking. All horses should be taught to walk fast, as it is their easiest and most economical pace, and it will help them over a great deal of ground in a day, even with a heavy load, and with comparatively little effort. A horse that steps short, and digs his toes into the ground, is worthless as a traveler, and suited only to a ferry-boat or bark-mill. It is important that a horse be good tempered. If inclined to viciousness he should be gently yet firmly managed when it is first apparent. A resort to great severity will be justified if necessary to conquer him; for, if once allowed to become a habit, it will be difficult to cure him. Grooms and mischievous stable boys frequently do much injury by their idle tricks with horses, and, when detected, they should be discharged at once. Some horses are nervous, easily excited, and start at every unusual noise or object. Others are restive and fretful, and ever anxious to be on the move. Kindness, and firm, yet mild, treatment, by which their motions and will are at all times controlled, and their confidence secured, are the only remedies. Others are inclined to sluggishness. These should have stimulating food, and never be overloaded or overworked, and then kept well to their paces. Whatever they are capable of performing can in this way only be got out of them. Habit has great influence with animals, as with man; and, when within the compass of his ability, he may be habituated to any reasonable physical exertion. More horses are ruined by unskillful breaking and overwork when under six years old, than in any other way. A horse ought never to be put to full work before seven years old.

Breeding.—Agreeably to the general principles well understood, such animals should be selected as most eminently possess those points which it is desired to propagate, and these they should not only exhibit in themselves, but should inherit as far as possible from a long line of ancestry. For the perpetuation of particular points in progeny, it would be safer to rely on the latter quality than the former. The selection of a mare, relatively larger than the horse, is an important rule in breeding, and it is believed that much of the success of Arabian and other Eastern horses as stock-getters, has resulted from the application of this principle. They possess valuable traits, but condensed within too small a compass. When such an animal is put to a well-bred, larger mare, the fœtus has abundance of room and nourishment to develop and perfect the circumscribed outlines of the male parent, and acquire for itself increased volume and character. The horse ought not to be less than four or five, and the mare one year older, before being put to breeding. It would be still better to defer it for two or three years, or till the frame is fully matured. A mare intended for breeding should never be highly fed on grain, nor overworked ; or, if they have been so, a previous run of some months on grass, or hay without grain, should be allowed to put them into natural condition.

The gestation of the mare sometimes varies from forty-four to fifty-six weeks, but she usually goes with young from forty-seven to fifty ; and it is advisable she should take the horse at a time which will ensure the foaling when the weather is settled, and there is a fresh growth of grass. She will be the better for light working till near the time of foaling, if well, but not too abundantly fed. In a few days after this she may resume moderate labor ; and, if not in the way or troublesome, the foal may run with her ; but, if she is exposed to heating, it should be confined till she cools, as suckling then is decidedly injurious to it. The mare is in danger of slinking her foal from blows and over exertion, the use of smutty grain, foul hay, or offensive objects of smell ; and, when this has once occurred, which happens usually in the fourth or fifth month, she should afterwards be generously fed at that period, and only moderately worked. When liable to slinking, the mare should be

removed from others in foal, lest a peculiar sympathy should excite an epidemic. The mare comes in heat from nine to eleven days after foaling, when she should be put to the horse, if it be desirable to have a colt the following season. She comes round at intervals of about nine days each.

THE COLT.—The colt may be weaned when five to seven months old, and preparatory to this, while with the mare, may be taught to feed on fine hay, meal or oats. When taken away, he should be confined beyond a hearing distance of the dam, and plentifully supplied with rowen or aftermaths, hay, mashed or ground oats, or wheat shorts. It is economy to provide a warm shelter through the inclement season for all animals, and especially for colts, which, with all other young, should have an abundance of nutritious food. They will thus growe venly and rapidly, and attain a size and stamina at two years old they would not otherwise have acquired at three. Every colt should be thoroughly halter broken during the winter before a year old. He will be all the easier managed afterwards.

Castrating.—The colt should be altered at about one or one and a half years old, but, if thin in the neck and light before, the operation may be deferred to a year later. Few of the French diligence and farm horses, and scarcely any of the Oriental, are ever castrated. They are thought to be more hardy and enduring ; but the slight advantage they may possibly possess in this respect would illy compensate for the trouble and inconvenience arising from their management. The operation should be performed late in the spring or early in autumn, while the weather is mild. If in high condition, the animal should be well physicked. The easiest, safest and most convenient way is to cast him by ropes on his legs. The scrotum should be opened on both sides, and the testicles cut, or rather the cord scraped off, and tied, which prevents much bleeding. The wound may be dressed with a little lard ; then turn him loose in a pasture which has a shelter from sun, wind or rain. Docking is practiced by many, but merely to gratify an absurd and cruel caprice, without a single advantage, and the animal is better in every respect with the tail unmutilated.

Breaking.—While feeding in the stable, the colt should be

gently treated, and accustomed to the halter and bit, which prepares him for breaking. If permitted to run with the others while at work, he becomes familiarized to it, and, when harnessed by the side of some of his well-trained mates, he considers his discipline rather a privilege than a task. The colt may be taken in hand for breaking at three, and thoroughly broken to light work at four, but should not be put to hard service till six or seven. A due regard to humanity and sound judgment, in thus limiting the burden in his early years, will save much disease and suffering to the animal, and profit the owner by his unimpaired strength and prolonged life. The annual loss from neglecting this precaution is enormous, which might be entirely avoided by less eagerness to grasp the substance, while as yet the shadow only is within reach. Many animals are thus broken down at twelve, and are in their dotage at fifteen, while others of good constitution, if well treated, perform hard service till thirty.

How to Tell the Age.—The age of the horse is usually determined by the appearance of the teeth; of these there are two sets: first, the milk teeth, which come before the age of one year; second, the "permanent set," which come soon after the falling out of the former. This change is completed at the age of five years.

The teeth which are most uniform in their progression are the nippers or incisors, those on the lower jaw being ordinarily referred to. Of these nippers there are six—those farthest from the centre are called "corner teeth."

These corner teeth, and, indeed, all of the nippers, are composed of a bony substance which is inclosed in the enamel, which gives hardness to the teeth. Their form is somewhat conical, though irregularly so. (Fig. 1.) The top of a newly-formed tooth, say the corner tooth of a five-years-old horse, is long from side to side, while, a little farther down, the form becomes more triangular; and near the bottom—that part of the tooth which is below the gums in early life—it is long from front to rear, and narrow from side to side. This is shown in fig. 2, which represents a tooth cut across at various distances from the top of the crown, and in which the different forms of

the different parts of the tooth are plainly represented. Now, suppose the tooth to be split down the middle, from one end to the other, on a line passing across the top of the tooth, from the outer side to the inner side, as the tooth stands in the jaw. This will give a sectional appearance like that in fig. 3, the concave side being the inner side. The hard enamel which coats the outer portion of the tooth folds inward and passes down, forming a cavity, nearly to the bottom of the tooth, and then returns near the inner edge, until it joins the exterior coating of enamel on that side. The cavity thus formed is filled with a dark-colored matter, and it is closed, or nearly closed, at the top by a dishing cover of enamel. We are now prepared to understand how the appearance of the teeth becomes changed with age. The corner tooth, at five years of age, is long from side to side, and has, at its summit, a deep cavity called a "mark," which is represented at the top of figures 2 and 3, and their general appearance is similar to that represented in figure 4.

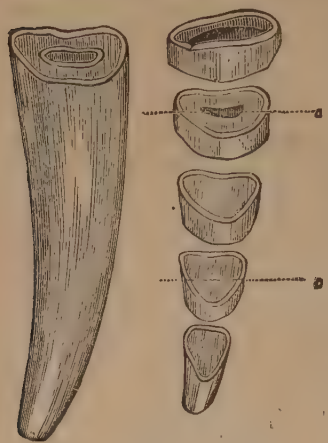


Fig. 1. Fig. 2.

Fig. 3.

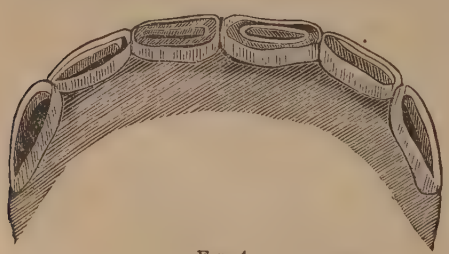


Fig. 4.

As the horse becomes older, his teeth are worn away by use, and it is to this cause only are due the changes by which we determine his age. The effect of this wearing down is the same as would be that of cutting or sawing off a portion of the teeth. They are supposed to be worn down about one-twelfth

of an inch per year, though the precise amount must depend very much on circumstances, such as crib-biting, vigorous feeding, etc. If we look at the mouth of a horse eight or nine years old, we shall see that his corner teeth have been so worn down that the mark, or superficial cavity, is entirely destroyed, and that the surface has descended to the point marked by the lines *a*. *a*., figures 1 and 3; still later the upper surface of the tooth descends to the point marked by the lines *b*. *b*., figures 2 and 3. The folding in of the enamel has now almost entirely disappeared, leaving very little discoloration on the teeth, while the upper surface of the teeth is almost triangular, instead of being long from side to side, as was the original surface. The teeth of the lower jaw now present the appearance shown in figure 5.

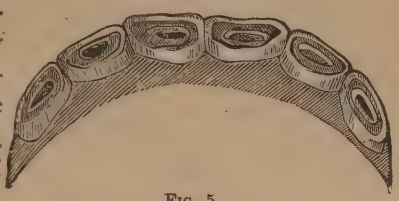


Fig. 5.

At the age of twenty-one years, the teeth of the lower jaw become very long from front to rear; this having always been the shape of that part of the tooth which has never until now been made apparent. The teeth at this age are represented in figure 6.

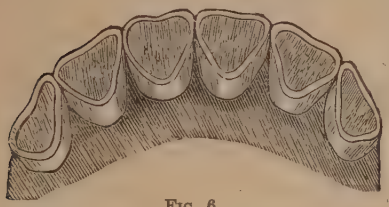


Fig. 6.

The experience of horsemen has established the following rules for determining the age from the appearance of the teeth: At birth the teeth have not appeared; six or eight days thereafter the two middle nippers of the set of milk teeth are cut; the pair next to them are cut at thirty or forty days; and the corner teeth at six to ten months. These teeth have all the mark, or superficial cavity, when first cut; this, however, disappears in the teeth of the lower jaw, in the middle

Fig. 7.

nippers, in ten months; in the next pair at one year; in the corner teeth at from fifteen months to two years.

The milk teeth give place to the permanent set as follows: The middle nippers at two and a half to three years; the next pair at three and a half to four years; the corner teeth at four and a half to five years. These periods may be hastened three or four months by pulling or knocking out the milk teeth.

At five years, the corners are up even with the other teeth, the mark is entirely worn out from the middle nippers, and partly worn from the next pair (fig. 4). At six years, the mark is almost gone from the second pair, and the outer edge of the corner teeth is worn down. At seven years, the mark is entirely gone from the second pair, the edges of the corner teeth are worn somewhat flat, though there is still a slight cavity in the centre. At eight years, the teeth of the lower jaw are worn entirely flat, the mark having disappeared from all of them. The form of the surface of the tooth has become oval, and the central enamel is long from side to side, and is near to the front of the tooth. At nine years, the middle nippers are rounded on the inner side, the oval of the second pair and of the corner teeth becomes broader, the central enamel is nearer to the inner side, and the marks have disappeared from the teeth of the upper jaw (fig. 5). At ten years, the second pair are rounded on the inner side, and the central enamel is very near to the inner side. At eleven years, the corner teeth are rounded, and the central enamel becomes very narrow. At twelve years, the nippers are all rounded, and the central enamel has entirely disappeared from the lower jaw, but it may still be seen in the upper jaw. At thirteen years, the middle nippers commence to assume a triangular form in the lower jaw, and the central enamel has entirely disappeared from the corner teeth of the upper jaw. At fourteen years, the middle nippers have become triangular, and the second pair are assuming that form. The central enamel has diminished in the middle nippers of the upper jaw. At fifteen years, the second pair have become triangular; the central enamel is still visible in the upper jaw. At sixteen years, all of the teeth in the lower jaw have become triangular, and the central enamel is entirely removed from the second pair in the upper jaw. At seventeen years, the sides of

the triangle of the middle nippers are all of the same length; the central enamel has entirely disappeared from the upper teeth. At eighteen years, the sides of the triangle of the middle nippers are longer at the sides of the teeth than in front. At nineteen years, the middle nippers become flattened from side to side, and long from front to rear. At twenty years, the second pair assume the same form. At twenty-one years, all of the teeth of the lower jaw have become flattened from side to side, their greatest diameter being exactly the reverse of what it was in youth.

Feeding.—The vigor and duration of the horse depend much on proper feeding. Like the cow and sheep, his natural and proper aliment is the grasses, grain and roots. In the middle and northern sections of the country, his dry forage is almost invariably good meadow hay, generally timothy, which is the richest of the cultivated grasses. At the South, this is often supplied by the blades of Indian corn. But in all the States, a great variety of the grasses and clover are used. When put to hard labor, grain ought always to accompany hay in some form. Of the different kinds of grain, oats are peculiarly the horse's food, and they are always safe, digestible and nutritive. Barley is the best substitute for it. Wheat and Indian corn are sometimes given, but either, alone, are unsuitable; the first is too concentrated, and the latter too heating. They ought to be sparingly used, and only when ground. The offal of wheat, as shorts or bran, is excellent, particularly when mixed with about one-third Indian corn meal. Grain is always more advantageously fed when ground or crushed, and wet some time previous to eating, and it is still better when cooked. On both sides of the Mediterranean, in the Barbary States, in Spain, France and Italy, much of the food is given in small baked cakes, and the saving in this way is much greater than the expense of preparing it. When confined to dry food, roots or apples fed once a day are always beneficial. They keep the bowels open, the appetite and general health good, and contribute largely to the nutriment of the animal. Carrots are the best of the roots, as, besides giving muscle and working power, they, more than any other, improve the wind and remove all tendency to heaves. They have even been found

effectual in curing an obstinate cough. By many of the keepers of livery stables they are always used, for which purpose they command the same price as oats. Potatoes, parsnips, beets and Swedes turnips, in the order mentioned, are next to be preferred. Potatoes are improved by cooking. Mixtures of food are best, as of cut hay, meal and roots. Old horses, or such as are put to hard labor, will do much better if their food be given in the form easiest of digestion. No inconsiderable part of the vital power is exhausted by the digestion of dry, raw food. Horses ought to be fed, and, if possible, exercised or worked regularly, but never on a full stomach. This is a frequent cause of disease, and especially of broken wind. If their food is given at the proper time, and the horse be allowed to finish it at once, without expecting more, he will lie down quietly and digest it. This will be much more refreshing to him than to stand at the rack or trough nibbling continually at his hay or oats. What remains after he has done feeding should be at once withdrawn. They should have water, in summer three times, and in winter twice, a day. Soft or running water is much the best. While working, and they are not too warm, they may have it as often as they desire. Neither should they be fed when heated, as the stomach is then fatigued and slighly inflamed, and is not prepared for digestion till the animal is again cool. Salt should always be within reach, and we have found an occasional handful of clean wood ashes a preventive of disease and an assistance to the bowels and appetite.

Shoeing.—With a poor hoof an otherwise valuable horse becomes almost worthless, so that the common saying, "no foot, no horse," is practically correct; for this reason, the subject of horse shoeing is one which should receive much attention, as it is by poor shoeing that so many horses are rendered almost valueless for life.

For want of space we can only give some of the more important points which should be observed in order to preserve the hoof in a natural and healthy condition.

The hoof, in its natural state, is adapted only to a grassy surface; so that, when we wish to bring the horse into practical use upon our hard and stony roads, it becomes necessary to

protect the hoof, by shoeing, from the unnatural wear and tear which it is subject to.

It is greatly to be regretted that so large a share of the men who are permitted to do this very important work, of shoeing the horse, are so ignorant of the nature and structure of the foot, and the principal rules which should guide them in doing this very important branch of work.

It is a great fault of nearly all shoers that they cut and pare with the idea of improving the foot, when their aim should be, mainly, to let nature have her course as much as possible, or in other words, to imitate the natural condition of the foot, and only pare away such parts as have become useless. The shoe should always be fitted to the foot and not the foot to the shoe, as is often practiced. That part of the hoof which should not have pressure is the portion between the bar and the quarter, commonly known as the seat of corns.

The greatest pressure should be around the outside of the foot, for about half an inch.

The frog should be allowed to come to the ground, which will prevent, to a certain extent, the concussion which would otherwise take place. The frog should not be cut down, as is frequently practiced, nor should it be touched, when healthy, except for the purpose of cleansing.

In paring the foot be very careful not to cut down the outside, so as to allow the entire weight to rest on the inside of the shoe upon the sole, but only cut away the dead portion of horn on the sole, and cut down the wall from heel to toe until the bearing is natural, leaving it even and as near its natural state as possible. A red hot shoe should not be allowed to be burned into the foot to fit it.

The shoe to be selected should depend upon the condition of the foot and the condition of the roads, etc. The flat shoe, when properly applied, leaves the foot nearest its natural shape, by allowing the horse a good, even foundation to stand upon, and is most likely to give satisfaction for all ordinary purposes. At some seasons of the year it will be necessary to have calks upon the shoes, but, ordinarily, the foot should be allowed to come as near the ground as possible.

What we mean by the flat shoe is flat upon its superior surface, which comes in direct contact with the hoof, the under surface being partially concave, so as to assist the horse in grasping the ground, to prevent slipping, and to assist in progressing.

The shoe should be as big as the foot, so as not to require any cutting down the hoof to make it fit the shoe, and the heels of the shoe should not be permitted to project backwards beyond the heel of the hoof more than about one-eighth of an inch.

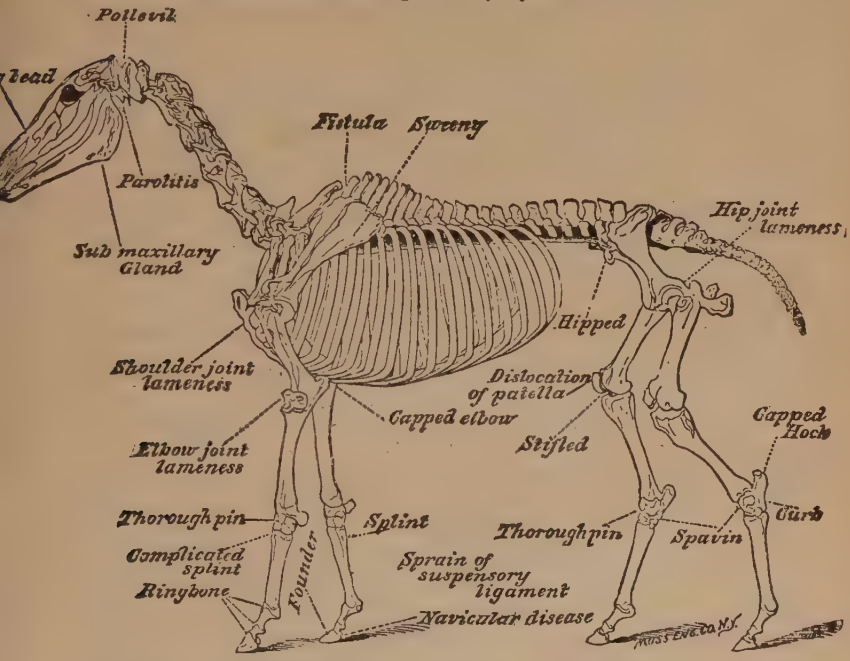
The outward margin of the shoe should just correspond with the shape of the foot, except at the head, where the shoe should be a little wider from quarter to heel, especially on the outside.

Many persons are not aware of the thinness of the hoof, which makes it quite necessary that the nail holes should be near the edge, and quite well forward in the toe, so as to avoid driving the nails into the quick, which would cause serious lameness and injury.

Do not rasp under the nail clinches, nor over them ; and do not use the rasp at all on the outside of the hoof, not even below the clinches, except just enough near the shoe to round the edge, and do not cut down the hoof if you have used a shoe which is too small.

A nail for a horse's foot differs materially from every other kind of nail, not only in shape, but in quality of iron from which it should be made; it is important that it should be made from the very best of iron, free from flaws, seams, liability to sliver, and all sulphurous gases in the process of manufacture. It is presumed that every shoer knows that a nail forged hot, from the end of a rod, needs no argument to convince any one that a better nail is thus obtained than by punching, rolling and shearing them from a cold plate. The numerous and well authenticated cases where valuable horses have been ruined by using cold rolled nails are enough to deter any first-class shoer from driving anything but a hot-forged nail, even if their cost should be double that of the cold rolled nail, because no shoer can take the risk of injuring his customer's horse.

Use only the very best of nails; drive as small and as few nails as will hold the shoe firmly and securely to its place. See that the nails fit the holes, and the heads the crease, leaving little, if any, to project beyond the ground surface when finished, thus preventing the clinch from rising when brought in contact with stones, and saving the injury of the ankle.



A horse is a hardly worked animal at the best. It is a willing servant and exerts its utmost force at the instigation of the driver, instinctively and cheerfully. A vicious, stubborn horse is made so; it is not a natural product, but its natural docility and willingness to work are destroyed by abuse and mismanagement. But how many horses are overworked, which are forced by fear of the whip to over-exert the muscles and sinews, and so incur injury and disease!

We give herewith a representation of the skeleton of a horse, showing the wonderful mechanism of its limbs and joints, and the perfect combination of levers by which the contractile force of its muscles and sinews is increased and multiplied

either in the drawing of loads or in swift movements. One cannot study the anatomy of this complicated machine without surprise that the noble animal built around it should escape, as it does, from more frequent strains and injuries to the delicate parts, nor that it should suffer, as it does, from the inconsiderate or ignorant usage of so many owners. In fact, there is not a disease here marked down which is not directly or indirectly brought about by misuse or careless management, directly in the animal itself, or indirectly by injury to its progenitors, by which the disease has become constitutional and hereditary. This may be shown by tabulating the various diseases pointed out, together with their usual causes, as follows :

DISEASES.	CAUSES.
Poll-evil, fistulous withers, capped elbow, hip joint lameness, capped hock.	Blows, bruises and falls.
Big head, laminitis or founder.	Innutritious or excessive feeding.
"Sweeny," or wasting of the shoulder muscle, shoulder joint lameness, elbow joint lameness, thorough-pin, splint, laminitis, ring-bone, navicular disease, side-bones, stifled, luxations of patella, or sprain of the joint, curb and spasm.	Sprains, wrenches or concussions by over-work, overdriving, running down hill, over-loading, and over-exertion.
Big-head, splints, curb, spavins, thorough-pin ring bone.	Constitutional and hereditary.

All the above are preventable, and it may no doubt help greatly in the very easy prevention of them, to point out in this clear and expressive manner the original sources of these various diseases, adding to this a few remarks upon the anatomical structure of the bones and joints.

Bones are formed of a cellular and fibrous mineral structure, filled in and strengthened with gelatine. The mineral matter consists chiefly of phosphate of lime, with some little carbonate of lime and other mineral salts, in all to the extent of about 55 per cent. in dry bone ; the gelatinous and fatty matter amount to about 45 per cent. During life the bone of an animal contains about 25 per cent. of water. Bones are perforated by numerous canals through which blood vessels and nerves penetrate in every direction. They are furnished at their ends, where they come in contact with other bones, as at the joints, with a hard, tough, fibrous, matter, known as cartilage, which is more abundant in young animals than in old ones, and they are covered all over with a delicate and most sensitive fibrous and vascular tissue, known as the periosteum or covering membrane of the bone. Joints are formed

by articulations of the bones, contrived so that one bone may move upon another, as in a hinge ; some joints have a motion in but one direction, as a knuckle joint, a true hinge ; and some have a more or less rotary motion, as the hip joint, the commonly called whirl-bone. The joints are provided with a slippery serum, known as the synovial fluid, which serves to lubricate them, and ease their motions, and to prevent friction of the tender, sensitive membranes which cover them. The sinews and tendons which connect the joints with the muscles by which they are set in motion, are also provided with the same synovial fluid and a covering membrane similar to the periosteum. When a limb is moved, the joint is bent by a drawing of the tendon attached to it, and the tendon is drawn by the contraction of the muscle of which it is the prolongation. The tendons act directly or over pulleys, which may be bones or bands of other tendons. In short, the whole structure of the muscular system is a most complicated system of springs, bands, pulleys and cords, by which the levers and hinges of the bones are brought into action. The voluntary nerves, all of which proceed from the brain, or are connected with it, are the intelligent agents of the will of the animal to put into action the mechanism of the muscles and bones.

Now, if the food of the animal does not supply an adequate quantity of mineral matter required by the bones, they become soft and porous ; there is an excess of vascular structure, which causes enlargement, and this excess of matter produces disease and decay of the structure, as we find in the diseases known as big-head and rickets ; or the bones become weak and malformed or bent in an irregular shape. When the sensitive membrane is bruised, it becomes inflamed and may suppurate and the inflammation may attack the bone, as in poll evil, fistula of the withers, and abcesses on the jaws or on the face ; or it may produce an excessive growth of cartilage or bone, as in spavins, ring-bone, and splints ; or, when the tendons are involved with the joints, an excess of synovial fluid may be secreted, and bog-spavins, thorough-pin, or curb, may be produced. When by a sudden force a muscle or tendon is stretched or strained beyond its natural extension, it is sprained, and perhaps some of the fibers may be ruptured,

when inflammation occurs, as in hip joint or shoulder lameness. When by reason of the consequent pain the muscle is not used—as well as the wasting by the inflammation—the muscle shrinks, and atrophy or loss of substance, the so-called sweeny, occurs. So, too, in stifle joint lameness, the loose bone, the knee-cap or patella, becomes so loosely held by the muscles that it slips out of place, or it may be drawn out of place. and the leg rendered wholly useless for the time being. Lastly, the construction of the hip may be pointed out with its peculiar combination of bones, so easily disturbed by dislocation or by fracture by a sudden fall or slip, as is far too common, not only with horses, but more so with cows, driven recklessly upon slippery floors or icy ground. But, without going further into it, this interesting subject is submitted in the hope that it may lead our readers to give it the attention it deserves, and to study it out more completely for themselves.

DISEASES AND REMEDIES, BY AN ENGLISH FARRIER.

Bots.—The stomach seems to be the natural nursery for the protection and the propagation of the stomach bot. When the eggs have remained in the stomach for a year, they become a perfect chrysalis, (that is, the form of a butterfly before it reaches the winged state,) and then they release their hold of the stomach and are expelled with the dung. It will be provided with wings in a short time, and will fly about commencing the propagation of its species, which passes through the same period of incubation.

They are of two kinds, stomach and fundament bots. The stomach bots are the result of turning horses into pasture in summer months, and are produced from the eggs laid on the fore legs of the horse by the bot fly.

Symptoms are an unthrifty coat, and loss of flesh after running out to pasture.

All horses which run out to grass are quite sure to have bots in their stomachs, and, as there is so much misconception about bots and their destructiveness to horses, we copy the result of a series of experiments with bots three-fourths grown.

When immersed in rum they live 25 hours ; decoction of tobacco, 11 hours ; strong oil of vitrol, 2 hours 18 minutes ; essential oil of mint, 2 hours 5 minutes. Were immersed, without apparent injury, in spirits of camphor, 10 hours ; fish oil, 49 hours ; tincture aloes, 10 hours ; solution indigo, 12 hours. A number of small bots, with one that was full grown, were immersed in a strong solution of corrosive sublimate, one

of the most powerful poisons ; the small ones died in one hour, but the full grown one was taken out of the solution six hours after its immersion, apparently unhurt.

It will be seen by the above experiments that no medicine can be given which will affect the bot, that will not destroy the coating of the stomach and injure or kill the horse. No veterinary surgeon can distinguish the symptoms of bots from those of colic. In fact there is but little doubt that ninety-nine out of every hundred cases of belly ache are no more nor less than colic and not bots, and should be treated as we direct in the treatment of colic.

FUNDAMENT BOT.—Like the stomach bot, this is also the result of running out to grass. Instead of the eggs being deposited on the legs, they are deposited on the lips of the horse. They are found in the rectum, and often seen about the anus and under the tail.

TREATMENT.—The general condition of the horse should be improved, so that the debilitating effects of the bots may not interfere with the general health of the horse. It is generally considered impossible to expel or destroy the bots. Give the following tonic medicines to improve the general condition: pulv. gentian, 1-4 lb.; pulv. copperas, 1-4 lb.; pulv. fenugreek, 1-4 lb.; pulv. elecampane, 1-4 lb. Mix well and give a large tablespoonful once a day.

ANOTHER REMEDY.—When a horse is attacked with bots, it may be known by the occasional nipping at their own sides, and by red pimples or projections on the inner surface of the upper lip, which may be seen plainly by turning up the lip.

First, then, take new milk, 2 qts.; molasses, 1 qt., and give the horse the whole amount. Second, 15 minutes afterwards, give very warm sage tea, 2 qts. Lastly, 30 minutes after the tea, you will give of currier's oil, 3 pts., (or enough to operate as physic). Lard has been used, when the oil could not be obtained, with the same success.

The cure will be complete, as the milk and molasses cause the bots to let go their hold, the tea puckers them up, and the oil carries them entirely away. If you have any doubt, one trial will satisfy you perfectly. In places where the currier's oil cannot be obtained, substitute the lard, adding three or four ounces of salt with it ; if no lard, dissolve a double handful of salt in warm water, three pints, and give all.

Bowels, Inflammation of.—The symptoms are very severe pain in the belly, varying from those of colic in being a continuous pain (while in colic there are intervals of rest from pain), rolling, pawing, sweating, rapid breathing, with an inclination to shift about, with great fever and excitement. The

disease comes on more gradually than colic (which see), legs and ears cold, belly tender and painful on pressure.

CAUSES.—Constipation, exposure to cold, drinking cold water, in large quantities, when hot, hard driving, diarrhœa, and as a sequel to colic.

The above named causes, when occurring in a horse predisposed to the disease, are quite liable to bring it on.

TREATMENT.—If the cause is constipation, give a quart of raw linseed oil, and if necessary add from 4 to 6 drops croton oil. If the cause is over-purging, give an ounce and a half of tincture of opium in a half pint of water.

If the cause should be other than costiveness or diarrhœa, give 30 drops of the tincture of aconite root, and repeat it in two hours. Apply blankets, wrung out of hot water, to the belly, and renew them every 15 minutes. Give injections of warm (not hot) water, castile soap, and a handful of table salt every half hour until the bowels move some. There is a diversity of opinion in regard to bleeding. It is my opinion that it is of doubtful utility in this disease.

Bronchitis.—This disease consists in an inflammation of the air passages of the lungs. It is a very common disease among horses, and is sometimes confounded with inflammation of the lungs (or lung fever), distempers and colds.

SYMPTOMS.—Begins with a chill, fever, harsh cough, labored breathing, mouth hot and dry, with loss of appetite, and in one or two days a discharge from the nostrils will be observed.

TREATMENT.—Give the horse a good, comfortable place (not too close nor the reverse). Give 15 to 20 drops tincture of aconite root, and repeat every six hours until four doses have been given, which will probably relieve the fever. Let the horse have plenty of cold water to drink. We would discourage the idea of bleeding, as it would be more likely to do harm than good.

After the fever has subsided, (which will probably be about the second day,) give a few powders of the following: Mix pulv. licorice root, pulv. fenugreek and pulv. gentian, two ounces of each, and divide into six powders, and give in feed two or three times a day.

Chronic bronchitis is the result of bad treatment of acute bronchitis, and when the attack has been prolonged for some time.

SYMPTOMS.—A cough, which seems to be confirmed, with discharge from the nostrils, and cough worse after drinking and in the morning.

TREATMENT.—Take of pulv. gentian and pulv. sulphate of iron, eight ounces each. Mix thoroughly and divide into thirty-five powders and feed twice a day until all has been given; then make an ointment of red iodide of mercury, one drachm; lard, one ounce, thoroughly mixed together. Apply the above named ointment down the course of the windpipe, and the next day apply sweet oil or lard to keep the skin from cracking. Repeat the application of the ointment in one week.

Burns and Scalds.—When the burn is so deep as to destroy the skin and superficial tissues, we would recommend raw linseed oil, applied with bandages, to protect the parts from the air, and allowed to remain for several days.

Remedy for a Cold.—People not much accustomed to study the diseases of horses, look upon a cold as a trivial matter. But they should bear in mind that nearly the whole of the disorders to which the noble animal is liable, derive their origin from a cold. The causes of colds are various, but the most usual one is riding the horse till he is hot, and then suffering him to stand still exposed to the cold air; removing him from a hot stable to a cold one. If the horse has been high fed and clothed, the cold contracted in this manner often proves very violent; and this is the reason why horses often catch a severe cold on their first coming out of the dealer's hands; neglecting to rub him down properly, and to rub the sweat carefully off when he comes in from a journey; and I have known grievous disorders brought on by removing horses into a new stable before the walls and plastering were dry. Workmen are often in fault for not leaving air-holes above; as, when a horse comes into a new stable, and gathers heat, it will cause the walls and plastering to sweat very much, especially if there are no air-holes left. Many a horse has lost his eyes, and some their lives, by being put into new stables before they were dry.

SYMPTOMS.—When a horse has caught a cold, a cough will follow, and he will be heavy and dull in proportion to the severity of the disease; his eyes will be watery; the kernels about his ears and under his jaws will swell, and a thin mucous gleet will run from his nose. If the cold be violent, the horse will be feverish, his flanks will heave, and he will refuse his food. The owners should be very careful to observe these last symptoms, because, when they appear, and are attended with a slimy mouth, cold ears and feet, moist eyes, and a great inward soreness, there is danger of a fever, and generally of a malignant kind. But when the horse coughs strongly, and snorts after it, eats scalded bran, and drinks warm water, moves briskly in his stall, dungs and stales freely,

and without pain, his skin feels kindly, and his coat does not stare, there is no danger, nor any occasion for medicine. You should, however, bleed him, keep him warm, give him some feeds of scalded bran, and let him drink warm water.

THE CURE.—If the horse feels hot and refuses his meat, it will be necessary to bleed him plentifully, and to give the following drink:

2 ounces of juice of liquorice.
2 ounces of salt of tartar.
2 drachms of saffron.
2 ounces of honey.

Cut the juice small, dissolve all together in hot water, and give it nearly cold. This drink may be repeated as occasion requires, but let twenty-four hours elapse first. Or give

4 ounces of aniseeds.
2 ounces of liquorice root.
1 ounce of gum scammony.
1 ounce of nitre.

Boil these together in three pints of water, for ten or twelve minutes; strain the liquor through a cloth; and add two ounces of honey to it, when you give it to the horse.

The following ball, commonly called the cordial ball, is one of the best yet found out for coughs and colds. Be careful to get your drugs good, for this ball is of great worth in many diseases; and few things will remove a cough or cold, or clear a horse's wind, sooner or better:

Take 4 ounces of aniseeds powder.
4 ounces of fenugreek.
4 ounces of liquorice powder.
4 ounces of elecampane powder.
4 ounces of flour of brimstone.
4 ounces of liquorice, cut small, and dissolved in white wine.
1 ounce of saffron, pounded small.
1 ounce of oil of aniseeds.
8 ounces of olive oil.
8 ounces of honey.

Bray them all well together till they come into paste, and if they should be too dry, add a little more olive oil and honey. The dose is about two ounces, and may be given three or four times a day if needful. These balls, consisting of warm, opening ingredients, are of great use; and given in small quantities, about the size of a pullet's egg, will encourage a free perspiration; but in case of a fever, they should be given with the greatest caution.

It will be of great use to put scalding-hot bran into the manger, that the horse may hold his head over it, and receive the steam up his nostrils, which will cause a running from them and relieve him very much. I have known asarabacca, dried and rubbed to powder, and blown up the nostrils, to cause a discharge; for, when a horse has caught a violent cold, he is often troubled with a pain in his head, which a good discharge of the nose is very likely to cure. For the same purpose the horse should be warmly clothed, especially about the head,

neck and throat, as it has a tendency to promote a running at the nostrils.

By this simple method, with proper care, hot mashes and warm water, most colds may be cured; and, as soon as the horse begins to feel heartily, and snorts after coughing, an hour's exercise every day will greatly hasten the cure. If the legs swell, and the horse be full of flesh, rowels are necessary.

A Cough and Asthma.—Among all diseases to which this noble creature is subject, none has given more perplexity to farriers than a settled cough; indeed it too often defies all the attempts of art, and the horse frequently becomes asthmatical, or broken winded.

CAUSES.—The causes are various. Sometimes it is owing to colds imperfectly cured; sometimes to pleurisies, or malignant fevers, which have left a taint upon the lungs or other vessels; sometimes to small eruptions in the glands, which cause the lungs to be much larger than they ought to be, and a quantity of phlegm, and mucilaginous juices, which stuff up the glands and branches of the windpipe; and sometimes to fleshy substances engendered in the large blood vessels; for all these things hinder a free respiration, and excite a cough. It is of the utmost importance to distinguish one kind of cough from another, and this makes the disorder so hard to cure; for it cannot be cured till the seat of the complaint be found out.

If the cough be of long standing, attended with a loss of appetite, wasting of flesh and weakness, it denotes a consumption; and that the lungs are full of knotty, hard substances, called tubercles. When a cough proceeds from phlegm, and mucilaginous matter, stuffing up the vessels of the lungs, the flanks have a sudden, quick motion; the horse breathes quick, but not with his nostrils distended like one that is broken winded; his cough is sometimes moist, and sometimes dry and husky; before he coughs he wheezes, and sometimes throws out of his nose or mouth large pieces of white phlegm, especially after drinking, and this discharge generally gives very great relief.

CURE.—If the horse be full of flesh, take from him a moderate quantity of blood. The next day give him scalded bran, and in the evening the following ball:

1 ounce of powder of aniseeds.
1 ounce of liquorice powder.
1 drachm of calomel, 8 drams to an ounce.

Work them into a ball with Barbadoes tar. Give this ball the last thing at night, and be careful to keep the horse out of wet, and from cold water the next day. On the second morning give the following purge:

1 ounce of Barbadoes aloes.
1 ounce of castile soap.

½ ounce of powdered ginger.
1 drachm of oil of aniseeds.

Bray them together in a mortar, with a little syrup of buckthorn, to make them into a ball, which is to be given in the morning, and plenty of warm water and walking exercise, till it be wrought off. It will not work the first day. In three days after, give six ounces of the cordial ball, in a little warm ale, fasting, and to fast two hours after. Repeat the calomel ball, physic, and cordial ball, six days after, in the same manner as before. Let the horse's hay be sweet, and his mangermeat scalded bran, with a spoonful of honey in each feed; let him have walking exercise in the open air, but be careful of wet and of cold water.

When this course has been pursued two or three times, give two or three ounces of the cordial ball every morning. The above method will remove most coughs, but if it fail, try the following:

1 ounce of gum ammoniacum, in fine powder.
½ ounce of gum galbanum, in powder.
2 drachms of saffron, brayed.
2 drachms of assafœtida, in powder.

Work them up with honey, or Barbadoes tar, into one ball; roll it in liquorice powder, and give it fasting, and to fast two hours after. This ball must be given every morning, for six or seven times, before it can have a fair trial. In the cure of this disease, the diet should be very moderate, the usual quantity of hay should be abridged and sprinkled with water, and the usual allowance of grain and water divided into several portions; for, with these regulations in diet, the disease will soon be cured; and, where it is incurable, the horse will be so far recovered as to be able to do a great deal of work.

It may not be improper here to add that some young horses are subject to coughs when cutting their teeth, and their eyes are also affected from the same cause. In these cases always bleed, and, if the cough be obstinate, repeat it, and give warm mashes, which are often sufficient alone to remove the complaint. When young horses have a cough that is caused by worms, as is often the case, such medicines must be given as are proper to destroy those vermin.

The Colic, or Gripes.—The colic proceeds from various causes; therefore, the method of cure varies; otherwise the medicines intended to cure it may increase it, and perhaps render it fatal. We shall, therefore, divide this disorder into three different species, and endeavor to give such plain directions for managing each, as cannot fail to prove very beneficial. The three species are these: 1. The Flatulent, or Windy Colic; 2. Bilious, or Inflammatory Colic; 3. The Dry Gripes.

The Flatulent, or Windy Colic.—SYMPTOMS.—The horse is very restless, lying down and starting up again. He strikes

his belly with his hind feet, stamps with his fore feet, and refuses his meat. When the pain is violent, he has convulsive twitches; his eyes are turned up, and his limbs stretched out, as if dying; and his ears and feet alternately cold; he falls into profuse sweats, and then into cold damps; often tries to stale, and turns his head frequently to his flanks; he then falls down, rolls about, and often turns on his back. This last symptom proceeds from a stoppage of urine, which generally attends this species of colic, and may be increased by a load of dung pressing upon the neck of the bladder.

CAUSES.—This disease often proceeds from catching cold by drinking cold water when hot, and the perspirable matter is by that means thrown upon the bowels, which causes them to distend violently, and sometimes brings on an inflammation in the small intestines, when the body begins to swell, and the cure is despaired of.

CURE.—The first thing to be done is to empty the straight gut with a small hand dipped in oil. This frequently gives room for the wind, before confined in the bowels, to discharge itself; and, by taking off the weight which pressed upon the neck of the bladder, the suppression of urine is removed, upon which the horse immediately stales, and becomes much easier. If the horse be young, and full of blood, it will be proper to take a sufficient quantity of blood from the neck.

When these purgative operations have been performed, the following may be given, as it seldom fails to give relief:

4 ounces of tincture of senno.
6 drachms of tincture of opium.
1 drachm of oil of juniper.
8 ounces of juniper berries, bruised.

Put one quart of boiling water on the juniper berries, let them stand a few minutes, strain it off, put all together, and give them to the horse.

If he does not find relief soon after taking this dose, both by staling and breaking wind, it is doubtful whether he will receive any benefit from it; so you must prepare the following clyster for him as soon as you can:

Take 4 ounces of camomile flowers;
2 ounces each of aniseeds, fennel and coriander.

Boil them in one quart of water, and add 2 ounces of Castile soap, cut small, while the water is hot, that the soap may dissolve. Give it blood warm. During the fit the horse may be walked about, or trotted a little, but should by no means be harrassed, or driven about till he is jaded. If no better, give the following:

2 drachms of camphor.
1 drachm of pellitory of Spain.
2 ounces of ginger powder.
3 gills of Holland gin.

If the horse sweats much at times, and then falls into cold sweats, give four ounces of mithridate, in three gills of Holland gin, and repeat the clyster. If the disorder continues three or four hours, give one ounce of the tincture of opium, in three gills of Holland gin. When the horse begins to recover, he will lie quiet, without starting and trembling; and, if he continues in this quiet state an hour, you may conclude that the danger is over. Dress him down well, and give him a small quantity of warm water, if he will drink it; bed him down well, cover him to keep him warm, and then leave him to get a little rest. You must consider that the disorder has left a little soreness on him, both within and without; therefore, make him a little gruel, with a pint of red wine in it; and, if any skin be knocked off about his eyes or his huck-bones, rub it with the wash recommended for bruises.

Sometimes the colic is received into the stomach, and does not act so violently, nor cause the horse's pain to be so strong. You may best judge of this by his motions. He will draw his four feet together, lay himself down, stretch out his feet and head, throw his head back, and often put his nose to his chest; after standing a little, he will lie down again as before. When the colic is easier, he will lie for an hour or more together, with his feet stretched out and his head thrown back, or with his nose upon his ribs. This is caused by bad feed, or bad water, or both; sometimes by drinking hard water when hot, or by a change from soft grit water to limestone or iron water, or by the break of a storm. I have had five or six horses under my care in this disorder in one day, at the break of a frost, by drinking ice or snow water. Sour grain, sour grass, dry meal, dust, bad hay, and many other things cause this disorder. Give the following, which is almost a certain cure in two hours:

1 ounce of spirits of sweet nitre.
1 ounce of spirits of nitre.
1 ounce of tincture of opium.
1 ounce of sweet oil.

All to be given together in a gill of warm ale. Bed the horse well down, and leave him that he may get a little sleep, after which he will get up and feed. This is one of the best medicines that has yet been found out. It has saved hundreds of horses, and will save hundreds more, if rightly applied.

The Bilious or Inflammatory Colic.—SYMPTOMS.—This kind of colic, besides most of the symptoms of the former, is attended with a fever, great heat, panting, and dryness of the mouth. The horse also generally parts with a little loose dung, and a little scalding hot water, which, when it appears blackish, or reddish, indicates an approaching mortification.

Take 3 ounces of senna.
1 ounce of salt of tartar. Infuse them in a quart of boiling water an hour—strain, and add
2 ounces of lenitive electuary.
4 ounces of Glauber's salt. Mix when hot.

If the disorder be not removed by the above medicine, but, on the contrary, the fever and inflammation continue to increase, attended with a discharge of flesh-colored matter, the event will probably be fatal; and the only medicine likely to prevent it is a strong decoction of Jesuit's bark, a pint of which may be given every three hours, mixed with a gill of red port wine; or you may give one ounce of the powder of bark with the wine. Or, if these cannot be got easily, give four ounces of tincture of rhubarb in three gills of red port wine. Also give a clyster every two hours, made of two new-laid eggs, well broken, and two ounces of molasses, in one quart of milk. Give it warm.

If the horse recover, it will be proper to give him a gentle purge or two in a week after.

Take 1 ounce of rhubarb in powder.
½ ounce of jalap, do.

Work them up into a ball with syrup of buckthorn, and give it to the horse, with warm water to work it off.

The Dry Gripes.—SYMPTOMS.—This disorder mostly proceeds from costiveness, and is discovered by the horse's frequent and fruitless attempts to dung, the blackness and hardness of the dung, the frequent motion of his tail, the high color of his urine, and his great uneasiness.

CURE.—The first thing to be done is to draw the dung out of the fundament, with a small hand, as far as you can reach, and then give the following:

4 ounces of castor oil.
4 ounces of tincture of senna.
1½ ounces of oil of juniper.

Give them altogether, and then the following clyster:

Boil in a quart of water a handful each of
Camomile flowers and
Marshmallows. Strain off and add
2 ounces of linseed oil, or pale oil.

If the horse do not mend, repeat both the drink and the clyster. During this disorder the horse must not have any dry food; but boiled linseed and scalded bran, with warm water to drink. Gentle walking exercise is a great means to cause the physic to work; but be careful of cold.

From the account that I have given of the different species of the colic, the reader will be abundantly convinced how necessary it is to be acquainted with each, that he may be able to give proper medicine, and to relieve the creature's excruciating pains. He should carefully avoid all hot, violent medicines,

which always prove hurtful in every species of this disorder, and frequently fatal. Nor is it any wonder that horses treated in that manner should die, for such medicines stimulate the neck of the bladder, augment the heat of the blood, before much too great, and inflame the bowels, by which a mortification is brought on and the horse is lost by the very means used for his recovery.

The Yellows, or Jaundice.—This disorder is very common in horses, and sometimes it is either unknown, or overlooked, till it gets much worse to cure. A young horse is easily cured, but an old horse is bad to cure.

SYMPTOMS.—The white of the eye is yellow, also the inside of the mouth, the tongue and the bars in the mouth are of a dusky yellow; the horse is dull, and refuses all kinds of food; a slow fever is perceived, which increases with the yellows; the dung is often hard and dry, and of a pale yellow color; the urine is generally of a dark dirty brown, and when it has settled, sometimes looks like blood; the horse stales with pain and difficulty; and, if the disorder is not checked, becomes in a short time unable to stir about. When this disease gets strong hold of a horse before proper medicines are applied, it is often fatal, or it brings on some other disorder as bad, or worse, than itself.

CURE.—Bleed plentifully, and, as this disease is always attended by a costive habit of body, it will be proper to give a clyster or two before you give the physic. A clyster may be made of one ounce of camomile flowers, boiled in a quart of water with two ounces of Castile soap. Then give the following ball:

4 drachms of Indian rhubarb.
2 drachms of saffron.
6 drachms of Socotrine aloes.
1 ounce of Castile soap.

To be brayed in a mortar with a little syrup of buckthorn, and made into two balls; one to be given the last thing at night, and the other the first thing in the morning; and give plenty of warm water to work them off. If the disease is obstinate, and will not yield to the above, give the following ball:

1 drachm of calomel, 8 drachms to an ounce.
1 ounce of Barbadoes aloes.
1 ounce of Venice soap.
1 ounce of turmeric.
1 drachm of oil of juniper.

All to be brayed in a morter with a little syrup of buckthorn, and made into two balls; one to be given at night, and the other in the morning, with plenty of warm water, and walking exercise till wrought off.

If the horse is better after the first medicine, repeat it, for

it is much safer than the last; but, if not, the last may be given, and repeated as need requires; but be careful not to give it in less than six days distance.

If, after giving one dose of the last ball, you give the following powders every day in celantine tea, if it can be got, or in warm ale, you will find them very useful in removing the complaint.

2 ounces of salts of tartar.
2 ounces of turmeric.

These powders are proper to be given after either of the former doses.

The Staggers.—This disease is caused by the liver making blood so fast that the cavity of the heart is overloaded and the blood flies up the neck vein till the head is overloaded too; and, if relief cannot be obtained, the horse soon dies.

SYMPTOMS.—The most common are drowsiness, watery and somewhat full and inflamed eyes, a disposition to reel, feebleness, a bad appetite, the head generally hanging down, or resting on the manger. There is little or no fever, and the dung and urine are very little altered. The horse soon begins to reel and falls down, and sometimes is so outrageous as to bite everything in his way.

CURE.—In the first place, bleed him well as soon as you possibly can, by striking the veins in several places at once, and take away four or five quarts at one time, and, in order to raise up his head and shoulders, support them with plenty of straw. If he survive the first fit, cut several rowels, give him clysters at night and morning, made of barley-water and a little sweet oil and salt; and blow up his nostrils a little cayenne pepper or white hellebore. Also give him

4 drachms of bark.
16 grains of turpeth mineral.
¼ ounce of camphor.

Give it in a little warm ale. When ale cannot be conveniently had, any other beverage to disguise the taste will answer. If the horse be outrageous, give him

1 ounce of tincture of opium.
1 gill of syrup of poppies.
1 ounce of tincture guaiacum.

Be careful not to let him knock his head, for it will increase the disorder. If he gets through the first fit, give him two ounces of crocus metalorum every day, to thin his blood for fear of a relapse. It will be proper to give him the following ball once a month for some time after:

1 ounce of rhubarb, in powder.
½ ounce of jalap.
1 drachm of calomel, 8 drachms to the ounce.

To be made into a ball with syrup of buckthorn. This ball will be of great use in thinning the blood, and preventing a return of the disorder; for when a horse has had one fit of it, he is very likely to have another, if care be not taken to prevent it.

Convulsions, or the Stag Evil.—Of all disorders to which horses are subject, this is the worst, and is scarcely discoverable till the horse falls down raging mad. It seizes him all at once, without any previous warning. He raises his head, with his nose toward the rack, pricks up his ears, and cocks his tail. In this posture he continues, and those who do not understand the disorder never suppose that he ails anything of consequence. But other symptoms soon convince them of their mistake; for his neck grows stiff, cramped and almost immovable; his jaws are locked, and every tendon in his body becomes stiff. If he can get his mouth open he will bite anythingthat comes in his way; and, if he lives a few days in this condition, several knots will arise on the tendinous parts of it. Every muscle is so much cramped and extended that the horse looks as if he were fastened to the place, with his legs stiff, wide, and staggering, and the skin drawn so tight over every part of his body that it is almost impossible for him to move; and if you attempt to make him walk, he will be ready to fall at every step, unless he be well supported. At the same time his eyes are so fixed by the contraction of the muscles as to give him a dead look. He snorts and sneezes often, pants continually, and his shortness of breath increases till the disdistemper takes a favorable turn, or the horse falls down and dies.

CURE.—In the first place, bleed plentifully, unless the horse be old and low in flesh, or taken from some hard duty, and then you must not take so much blood. After bleeding, give the following ball, if you can get it in, but the horse is very often jaw-locked, till nothing can be got in but by clysterpipe put between his fore and axle teeth.

½ ounce of assafœtida.
½ ounce of gum guaiacum.
½ ounce of gum camphor.

Make them up into a ball with honey, and give one of these balls every twelve hours, for two days, if you can get them in; and, if not, dissolve them in a little hot beer, and give them with the clyster-pipe. Be careful to powder the gums. Then make an ointment or lotion of the following:

1 ounce of oil of spike.
1 ounce of oil of amber.
1 ounce of spirits of sal ammoniac.

Shake them well together, and rub the jaws just below the

ears, where they lock in the upper chap; also rub the small of the back well, where the cross bones join the back bone.

In this, as in most other disorders, the body should be kept gently open with laxative purges and emollient clysters. When the jaws are so locked that you cannot get anything in, do not open them by force, for that would increase the disorder instead of relieving it.

Sheep-skins, newly taken off, and laid with the flesh side to the horse, will sweat him greatly, and by that means draw a quantity of water from the blood; indeed, there are few things that will relieve a locked jaw more; but, if they be laid on the loins, they must not lie above three hours at a time before they are turned with the wool side to the horse. You may keep the skins on twenty-four hours, if you change sides every two or three hours.

If the horse can not take either food or water in at his mouth, he must be supported by clysters, made of barley-water and milk, and given both at the mouth and fundament.

Fevers.—Horses are subject to few disorders which are not attended with more or less fever.

CAUSES.—Fevers are often brought on by sudden heats and colds; by going out of warm stables into cold ones; by being clothed and then having the clothes stripped off; and by being turned out to grass; for many people turn their horses out to grass in the morning, and letting them lay out, which is quite wrong; for when they are turned out to grass, to be there night and day, it is best to turn them out at night, for then they will graze all night; but, if you turn them out in the morning, they will fill themselves in the day time, and lie still all night, which is the way to catch cold. Most fevers are brought on by colds, therefore, be careful to keep your horses as much as possible from catching cold.

SYMPTOMS.—The horse is remarkably restless, ranging from one end of his rack to the other; his flanks work; his eyes appear red and inflamed; his tongue is parched, and his breath hot and of a strong smell. He often smells at the ground: he loses his appetite, and though he will take hay into his mouth, he does not chew it; his whole body is hotter than usual, but not parched; he dungs often, but little at a time, and it is generally hard, and in small pieces; his urine is high-colored, and he generally stales with pain and difficulty; he is always craving for water, but drinks very little at a time; and his pulse is much quicker than usual.

CURE.—Whenever a fever takes place, the first part of a cure is bleeding. And, if the horse be strong and in good condition, the quantity should be two or three quarts. When this

has been done, give him a pint at a time of the following infusion, three or four times a day :

4 ounces of juice of licorice
4 ounces of licorice root.
2 ounces of saltpeter.
4 ounces of salt of tartar.
8 ounces of good raisins.
1 ounce of aniseeds.
2 drachms of saffron.

Boil all these together in six quarts of water, for ten minutes ; let it stand till cold, and then strain it off. It is one of the best medicines for colds, coughs, hoarseness, or fevers, in either horse or man ; and, if it were more known, and more used, it would give greater relief in violent colds than anything yet found out. It is kind in its operations, opening to the lungs, works gently by stool and urine, is free in its passage, and opening in its nature.

The horse should scarcely eat anything but mashes made of linseed and bran, and given in small quantities. If he refuses them, let him have dry bran sprinkled with water, and put a little hay into his rack, as a small quantity of it will not hurt him, and a horse will often eat hay when he will not eat anything else. His water should be rather warm, and given often, but in small quantities ; and his clothing moderate, too much heat being pernicious in a fever. If he refuses his meat, do not let it lie before him, but take it away, and clean his rack and manger. If he be able to go about, a little walking exercise in the open air will be very proper, but you must be careful not to get him wet.

This method, with good nursing, will often be sufficient to restore the horse to health ; but, if he refuse his meat, more blood should be taken from him, and the drink continued ; and, if his dung be hard and knotty, a clyster should be given :

Take Marshmallows and
Camomile flowers, a handful each ;
Boil one-third away in three quarts of water, strain, and add
4 ounces of Venice treacle.
1 pint of pale rape oil.

The above will make three clysters, to be given at four hours' distance. If his pulse continue high and quick, give the following :

2 ounces of nitre.
2 ounces of cream of tartar.
4 ounces of Glauber's salt.
2 ounces of lenitive electuary.

Dissolve them in hot water, give one-half and the other half the day following. If the horse be very open in his body, you need not give the above ; but if dry, be sure to give it him. If he be very open, give him four drachms of bark in a gill of red port. By pursuing this method, the horse will begin to recover, and will relish his hay, though his flanks will

continue to heave for a fortnight. Nothing more will be requisite to complete the cure than walking him abroad in the air, and giving him plenty of clean litter to rest on in the stable.

A Broken Wind.—This disorder may sometimes be prevented but cannot be cured; and it has hitherto been as little understood as any to which a horse is subject. People have had various opinions respecting its cause, and why some horses are more subject to it than others; but, of all the opinions hitherto delivered, this seems the best founded: That it is frequently owing to the hasty or injudicious feeding of young horses for sale, by which means the growth of the lungs is rapidly increased, and all the contents of the chest so much enlarged that in a few years the cavity of the chest is not sufficient to contain them when they are expanded to perform their proper functions. Nor is this opinion founded on bare conjecture, for horses that have died broken-winded have been opened and the lungs and other parts found too large for the chest. But although hasty feeding is often the cause of this disorder, yet it is not always, for a narrow chest may cause it. It has been observed that horses rising eight years old are most subject to it. The reason is this: Because a horse arrives at his full strength and maturity at that age. At six he generally finishes his growth in height; then he lets down his belly, and spreads, and all his parts gain their full size; so that the pressure on the lungs and the midriff is now increased.

From observations, it abundantly appears that the enormous size of the lungs and other contents of the chest, by hindering the free action of the midriff, is the principal cause of this disorder; and, as the lungs are found much more fleshy than usual, they must consequently have lost a great part of their spring and tone.

Therefore, as this disorder is caused by the largeness of the lungs, we may conclude that it is one of those diseases which cannot be cured by art; and that the boastings of those who pretend to cure it are built on a sandy foundation. They may, indeed, relieve the complaint, but will never cure it, for an absolute cure is not in the power of any human being. All that I can do is to lay down some rules which have a great tendency to prevent this disorder, if pursued in time; and some remedies that will afford relief when it has taken place and render the horse capable of performing good service, notwithstanding his misfortune.

Symptoms.—The first symptom of a broken wind is an obstinate dry cough, which is neither attended with sickness nor loss of appetite; but, on the contrary, with a disposition to foul feeding, eating the litter, and drinking large quantities of water.

PREVENTION.—When a horse is troubled with an obstinate dry cough, and eats his litter, it will be necessary to bleed him, and to give him the mercurial physic already prescribed, repeating it two or three times. Afterwards give the following balls for some time, which have been found of great service :

4 ounces of gum ammoniacum.
4 ounces of galbanum.
4 ounces of assafœtida.
4 ounces of squills.
½ ounce of saffron.

Make the whole up into balls with honey and a little licorice powder, and give one about the size of a pullet's egg every other morning. This is a very good ball for a dry cough.

But it is not enough to give proper medicines ; the horse's diet should also be carefully attended to at the same time, if we would hope for success. In order to do this, the horse should eat very sparingly of hay, which, as well as his grain, should be wetted with chamber-ley, which is much better than water. Chamber-ley is best for this purpose, because of the volatile salts which it contains, as they are the means of removing the thirst. For the same reason, garlic is very efficacious in this disorder. Two or three cloves being given in each feed ; or three ounces bruised, and boiled in a quart of milk and water, and given every morning for a fortnight, has been found very serviceable. So easy a remedy should never be neglected ; for, by warming and stimulating the solids, and at the same time dissolving the tenacious juices which choke up the vessels of the lungs, it greatly relieves the complaint. Moderate exercise should never be omitted ; and, although broken-winded horses are not able to endure much labor the first summer, yet many have been found less oppressed the second, and scarcely perceptibly affected the third, being then able to perform a long journey, and to endure great fatigue. A horse kept constantly in the field, when not in work, will be able to do good service for many years.

It may not be improper to observe that those who hope to cure a broken-winded horse, or even one that is troubled with an obstinate cough, by putting him to grass, will find themselves wretchedly mistaken ; for, on being taken into the stable and fed with dry meat, he will be much worse than before ; and some that had only a dry cough, when they were put to grass, have returned broken-winded. Therefore, always remember that if you cannot keep a horse of this description constantly abroad, it is best not to put him to grass at all, as, instead of curing, it will tend to augment the disorder.

In short, the grand secret of managing horses of this kind, consists in having particular regard to their diet and exercise. A moderate quantity of hay or grain, and water, should be

given at a time, and the former constantly moistened, to prevent their wanting too much of the latter. They should have moderate exercise, but never any that is violent. By this method, and giving the following ball once every fortnight or three weeks, the horse will be able to do good service for many years:

6 drachms of Socotrine aloes.
2 drachms of myrrh.
2 drachms of galbanum.
2 drachms of ammoniacum.
2 ounces of bayberries, in powder.

Make the whole into a ball, with a little oil of amber, and a sufficient quantity of syrup of buckthorn. This ball operates so gently that there is no need of confinement, except a little the day following that on which it is given. The horse must have warm mashes and warm water, and the utmost care must be taken to prevent his catching cold.

Relief for Heaves.—Heaves, the common name for broken wind in the horse, is susceptible of great alleviation by attention to the character and quantity of food to be eaten by the animal, as every one knows. If a horse, suffering from this disease, is allowed to distend his stomach, at his pleasure, with dry food entirely, and then to drink cold water, ad libitum, he is nearly worthless. But, if his food be moistened, and he be allowed to drink a moderate quantity only at a time, the disease is much less troublesome.

A still farther alleviation may be obtained from the use of balsam of fir and balsam of copaiba, 4 oz. each, and mix with calcined magnesia, sufficiently thick to make it into balls, and give a middling sized ball night and morning for a week or ten days. This gives good satisfaction.

Lobelia, wild turnip, elecampane, and skunk cabbage, equal parts of each. Make into balls of common size, and give one for a dose, or make a tincture, by putting 4 oz. of the mixture into 2 qts. of spirits; and, after a week, put 2 tablespoonfuls in their feed, once a day for a month or two. This remedy is also good.

A Consumption.—Symptoms.—A consumption is a want of nourishment and waste of flesh. The horse's eyes look dull, his ears and feet are commonly hot, he coughs violently by fits, sneezes often, and groans at the same time; he gleets at the nose, and sometimes throws a yellowish matter, rather curdled, from his nose; his flanks have a quick motion, and he has little appetite to hay, though he will eat grain, but he grows hot after it.

Causes.—Damp stables are most likely to bring on this disorder, though it may be brought on by many other things.

In my time I have known many horses suffer much by damp stables. I knew a gentleman, who had two valuable horses, and he built a brick stable for them, without any air-hole above their heads. He put the horses in as soon as the stable appeared dry, and their heat soon caused the walls of the place to sweat, and to run down with water, by which means both the horses were thrown into a consumption and died. I mention this to caution others.

CURE.—The first, and indeed one of the principal things to be done, is to bleed in small quantities. A pint, or at most a pint and a half, is sufficient at once, and the operation is to be repeated whenever the breath is more than commonly oppressed. We are assured, by dissection, that in a consumption both the glands of the lungs and the mesentery are swelled, and often indurated. The only medicine that can be depended upon are mercurial purges and ponderous alteratives. I have already given you examples of the former, and the following is a formula of the latter. Mix

4 ounces of crocus metalorum.
1 ounce of calomel pp.
1 pound of gum Guaiacum, finely powdered.

Give about an ounce every day in a mash of bran and linseed. Iceland liverwort, a handful boiled in a gallon of water, is much better to make mashes up with than water; for it is a great helper of the blood. But it is to be observed that nothing will answer so good an end as spring grass; so that if the horse be afflicted with this disease in spring-time, turn him out to grass as soon as you can; and, if the night be cold, turn him out in the day-time, and take him in at night. Salt marshes are the most proper places, when they can be met with. When a horse has had this disorder, he can never more bear cold and hard service as before.

A Scouring, and other Disorders of the Intestines.—You should consider well what the scouring proceeds from, whether it is caused by foul feeding, bad water, hard exercise, sudden heat or cold, or overflowing of bile, or a weakness of the intestines.

If it is brought on by foul feeding, or bad water, it should not be stopped, but rather be promoted; for it should be remembered that nature by this means throws off the seeds of disease, and evacuates the morbid matter which would otherwise be retained to the great disadvantage, and, perhaps, to the destruction, of the animal. The great difficulty, therefore, consists in knowing when these discharges are critical and salutary, and when detrimental and noxious; for the former must not be checked, but the aid of medicine must be called in to put a stop to the latter.

For instance, if a healthy horse, upon taking cold, or after hard riding, over feeding, or at the beginning of a slight fever, have a moderate purging, you must be careful not to stop it, but, on the contrary, to promote it, by an open diet, and plenty of warm gruel. But, if this purging continue a long time, with smart gripings, and the inner skin of the bowels come away with the dung, and the horse lose both his flesh and his appetite at the same time, recourse must immediately be had to proper medicines; among which the following are very effectual. I do not wish any one to give medicines upon merely hearing the names of the drugs, but to know first in what manner the drugs will operate.

Take 2 ounce of rhubarb, in powder.
2 drachms of myrrh, in powder.
2 drachms of saffron.

Give altogether in warm ale and warm water, for two days after. This dose will not only work gently, but will be of great service to the horse, as it will bring away the slime which lodges in small intestines, and correct the bile of the stomach, and the horse's flesh keeps wasting away, recourse must be had to astringents. Tormentil root dried, and pounded in a mortar, and put through a sieve, is one of the best astringents yet found out, though very little known. The dose is from an ounce to an ounce and a half. I believe that this valuable root has done more good in my time, in stopping looseness and bowel complaints, than any thing else. When the purging is attended with fever, a different method of practice is necessary.

Take ½ ounce of rhubarb, in powder.
1 ounce of lenitive electuary.
½ ounce of camphor.
1 ounce of powdered ginger.

To be given in a pint of old ale. This is a very proper medicine when the horse is troubled with a fever · but if he have no fever upon him, give the following.

1 ounce of tormentil root, in powder.
½ ounce of Japan earth, do.

Give these in red wine, or if that be thought too expensive, in oak bark tea. Japan earth is a great healer of the bowels. Repeat this last medicine three or four times to allow it a fair trial; giving the horse at the same time but little exercise, for he cannot then bear much. Should this medicine fail, and the disorder increase instead of decreasing, which may be known by his flanks and belly being full and distended, and his appearing to suffer strong griping pains, give the following clyster:

½ ounce of isinglass, dissolved in a quart of warm milk.
2 ounces of mithridate.

Sometimes the flux is so violent as not to be overcome by the preceding medicine, when recourse must be had to the

following: Boil a handful of oak bark in a quart of water, strain it off, and add

2 ounces of tormentil root, in powder.
2 ounces of bole.

Give them all together. This should be repeated once a day for two or three days.

The practitioner should carefully attend to the symptoms that accompany this disorder; for if the discharge be attended with any acrid mucus, or slime, the griping pains being very severe, there is then a sure indication that the common lining of the bowels are wasted away; and then it will be necessary frequently to inject the following clyster, warm, in order to prevent the fatal consequences which will otherwise soon ensue:

4 ounces of starch, dissolved in a quart of water.
Half a pint of sweet oil.
Yolks of three eggs, well broken.
A little loaf sugar.

This will do for twice, at four hours' distance.

In treating this disease, be exceedingly careful to follow my directions, and to get good drugs, for your success will depend upon this and cautious watching of the symptoms.

It is also necessary to observe that some horses, from having weak stomachs and bowels, throw out their aliment undigested, and their dung is habitually soft and of a pale color; they also feed sparingly, and are always low in flesh. This complaint, which often proves fatal at last, may be removed by the following medicines:

6 drachms of Socotorine aloes.
3 drachms of rhubarb, in powder.
1 drachm of myrrh.
1 drachm of saffron.

Make all up into a ball with syrup of ginger. After the above stomachic purge shall have been given two or three times, a pint of the following infusion should be given every morning:

Take 2 ounces of orris root.
A handful each of
Gentian, Columbia root,
Winter bark, Aniseeds,
Orange peel, Fennel seed,
and camomile flowers.

Boil all together in a gallon of strong ale, and when cold clear it off, and add one pint of spirits of wine. If this be thought too strong, two quarts more of ale may be added. This is an excellent cordial for both healing and strengthening the stomach and bowels. These are the best methods of treating the above disorders, to which horses are often subject, and in which they are often lost for lack of proper treatment.

Disorders of the Kidneys and Bladder.—Inflammation of the kidneys and bladder are sometimes brought on by other disorders, and often by sprains, hard exercise, catching cold when hot, or from want of proper care.

SYMPTOMS OF A HURT IN THE KIDNEYS.—The horse is very weak in the back and loins; he stales with difficulty, is faint, eats very little; his eyes appear languid and of a dead color; his urine is foul, thick, and often bloody, especially after a violent strain; he cannot move backwards without a great pain, which may be seen at every attempt. It is sometimes hard to distinguish an inflammation from a sprain, or what is called "tifled in the back." There is no method but observing the gait of the horse. If he have got tifled in the back, he will be hard put to it to keep from coming down behind, and, indeed, will often come down; his eyes will look rather red, but his urine the same as before. A tifle lies in the marrow, or pith of the back.

CURE.—The principal remedy for a hurt in the kidneys is bleeding, which should be done pretty plentifully, as by this means an inflammation will be prevented; and if you have reason to think that the inflammation has already begun, from the creature's being feverish and staling with great difficulty, the operation should be repeated; for unless the inflammation be prevented, or immediately removed, the consequences will be fatal. But, although bleeding is the principal, it is not the only remedy, for rowelling is of great service. Put a rowel on each side of his belly, and give the following balls twice a day, in a pint of the decoction of marshmallows, having an ounce of gum arabic, and an ounce of honey, dissolved in it:

1 ounce of salts of Prunella.
6 drachms of spermaceti.
2 ounces of Castile soap.

Add as much honey as will make a ball; and if the urine be bloody, an ounce of Japan earth must be added. If the fever continue, you must repeat the bleeding and give emollient clysters, and the cooling, opening drink, before recommended for fevers, till it abate. These methods will often prove successful, but sometimes the disease is too obstinate to be overcome by them, and the urine still passes with pain and difficulty. Recourse must then be had to the following balls, and they must be prepared twice a day till the horse stales without pain, and his urine becomes clear, and without any purulent settlement:

1 ounce of Venice turpentine.
1 ounce of Castile soap.
6 drachms of nitre.
2 drachms of myrrh, in powder.

Make the whole into a ball with honey, and wash it down with a strong decoction of marshmallows.

These are the best methods of treatment in this disorder, and will in general prove successful. Sometimes, indeed, this malady is too strong for the power of medicine, and then the urine continues turbid, and daily becomes of a deeper color, with a fœtid smell, a sure sign that the kidneys are ulcerated; which generally terminates in a consumption, and the creature becomes absolutely incurable.

In treating of the colic, I have recommended a method for removing the stranguary, when it proceeds from wind, or from dung pressing upon the neck of the bladder; but sometimes it proceeds from an inflammation, and a retention of urine.

Symptoms of an Inflammation of the Neck of the Bladder.—When a horse is seized with a stranguary from the above cause, it will make frequent motions to stale, standing wide, and straddling, his bladder being full of urine, and his flanks distended; he will be uneasy, constantly shifting his hind feet, and often giving clicks in his motions; he also sometimes hangs his head, and then raises it suddenly.

Cure.—First bleed largely, and then give the following:

1 ounce of spirits of sweet nitre,
2 ounces of syrup of marshmallows
1 ounce of Venice soap.

Cut the soap small, dissolve it in a gill of hot water, put the above to it, and give it to the horse. Repeat it every eight hours. Also dissolve an ounce of gum arabic and an ounce of nitre in a gallon of water, and let him drink plentifully of it. If he will drink of his own accord, it is best; but if not, horn a little into him, for it will greatly tend to remove the cause of the disease, and consequently to terminate the effects.

There is a disease of the kidneys, viz.: a diabetes or profuse staling, which produces effects directly opposite. This disorder is seldom cured in old horses, as their fibres are become rigid and unable to perform their office, a misfortune which all the power of medicine cannot remove. But in young horses this disease is often cured, and the following method will generally be attended with success:

Cure of a Diabetes.—In order to cure this threatening disorder, great care must be taken not to let the horse drink too much water, and never to give him any moist food. Attention to these particulars will go a great ways towards a cure; and instead of giving him common water to drink, give him lime-water, to make which, take about three pounds of lime, pour six quarts of water into it; let it stand three days, take the scum off the top, and give the horse the water to drink. Be careful not to stir the lime at the bottom of the vessel. This is very clear, wholesome water, and very good for many disorders.

Some farriers give strong alum possets two or three times a day; but this kind of treatment cannot be proper, for the alum takes so fast hold of the juices of the stomach that if the horse were not ill, it would be enough to make it so.

The Molten Grease.—This is so common a disorder that it ought to be well understood, but, alas! like many others, it is often mistaken for something else. The disease is a melting down of the fat of the horse's body, caused by violent exercise in very hot weather; or, if the horse be full of flesh, it may happen in cold weather. Hard riding, or sudden colds, will bring on this disorder.

Symptoms.—It is always attended with a fever, heat, restlessness, starting and trembling, inward sickness, and shortness of breath. Also, the horse's dung is extremely greasy, and he often falls into a scouring. His blood, when cold, is covered with a thick scum of fat, of a white and yellow color, but generally the latter. The congealed part, or sediment, appears like a mixture of size and grease, and is so extremely slippery that it will not adhere to the fingers; and the small proportion of serum is also slippery and clammy. The horse soon loses his flesh and fat, the latter being probably dissolved into the blood. Such as have sufficient strength to sustain the first shock, commonly become hidebound, and their legs swell greatly; and in this state they continue till the blood and juices are rectified; and, if that is not done effectually, the Farcy, or an obstinate surfeit, is generally the consequence, which cannot be removed but with the utmost difficulty.

Cure.—In the first place, bleed pretty plentifully, and repeat the operation two or three days successively; but take care that you take only a small quantity at a time after the first bleeding, as otherwise the creature would be rendered too weak to support himself, and his blood too poor to be easily recruited. As soon as he has been bled the first time, let two or three rowels be put in, and the emollient clysters prescribed for fevers be thrown up daily, to mitigate the fever, and to cleanse the intestines from the greasy matter. At the same time plenty of water-gruel should be given, and sometimes a small quantity of water, with a little nitre dissolved in it. The latter will be of great service, as it will prevent the blood from running into grumous concretions, and proving the source of innumerable disorders, if not causing a total stagnation, and, consequently, the death of the animal.

The horse must be treated in this manner till the fever be entirely gone, and he shall have recovered his appetite; and then it will be necessary to give him three or four purges, a week distant from each other, which will make him stale and

perspire plentifully, and, at the same time, bring down the swellings of his legs. The following is well calculated for the purpose :

6 drachms of Socotrine aloes.
4 ounces of gum Guaiacum, in powder.
2 drachms of ginger.
2 drachms of jalap.
2 drachms of oil of juniper.

To be made into a ball with syrup of buckthorn. By pursuing this method the horse will soon be recovered, for this purge will mend his appetite, and increase his flesh. If it be too weak, add a drachm more of aloes. It will bring down his swelled legs, and carry away all the superfluous matter that clogs the blood. When you give the physic, be careful to give plenty of warm water all the time.

A Surfeit.—Some people pronounce every ill-thriven horse surfeited, whether he is so or not. A surfeit is nothing more than the effects of an ill-cured disease, and, therefore, what is called a surfeit in horses is very different to the disease which bears that name in the human body ; the latter being the beginning of a disease, and the former the remains of one.

Symptoms.—The horse's coat will stare, look of a rusty color, and even appear dirty, although the greatest pains have been taken to keep him clean. His skin will be covered with scales and dandruff, which will appear like meal among the hair, and, when cleaned off, will be followed by a succession of the same matter, occasioned by the perspiration being obstructed. Some horses will be covered with a kind of scab, sometimes moist, attended with heat and inflammation, and the humor so very sharp, and causing so violent an itching, that the creature is incessantly rubbing himself, and by that means making himself raw in different parts of his body. Some horses have neither scales, dandruff nor scab ; but look dull, sluggish and lazy. Some are hidebound, and others afflicted with flying pains and temporary lameness. In short, the symptoms are very various, and almost as numerous as those of the scurvy itself.

Causes.—The causes are as various as the symptoms. Some horses are surfeited by high feeding and want of proper exercise, which produce a bad digestion and generate ill humors. Some are surfeited by unwholesome food ; some by hard riding; some by bad or improper physic, and some by standing in stables through which the rain drops, or by lying wet. But as many also get surfeited by standing, when hot, at the doors of public houses, such bad practices should be guarded against.

Cure.—If we duly consider the nature of surfeits, their cure will be much more easily performed. All allow that they

arise from a bad state of the blood; but how is this to be remedied? By bleeding and purging. But this must be done in a very gentle manner. Take about a quart of blood, and the next day give the following ball:

1 ounce of Socotrine aloes.
1 drachm of calomel, pp.
2 drachms of oil of aniseeds.

Add as much lenitive electuary as will make it into a ball. Give plenty of warm water to work it off. Repeat both bleeding and physic in eight days and when the last dose is wrought off, give him the six ounces of the cordial balls in a little warm ale. Also give a spoonful of the following powders every day in a mash:

4 ounces of flour of brimstone.
4 ounces of crocus metalorum.
4 ounces of nitre, in powder.

Mix all up well together. By persevering in the above method you may cure the most inveterate surfeit, and, if any scabs or runnings appear in the skin, rub them with the following:

4 ounces of sulphur vivum.
2 ounces of white copperas.
2 ounces of white hellebore, in powder.

Mix these powders with churn-milk, rub the places affected well, and the grievance will soon disappear. Sometimes a surfeit settles in the legs, and they swell much, and then break out and run very much. When this is the case, two taps put into the lower belly will be of great use. Staling balls should be given every third day, and plenty of warm water to work them off with. Make the staling balls as follows:

1 ounce of white resin.
4 drachms of Castile soap.
2 drachms of oil of juniper.
2 drachms of camphor.
4 drachms of saltpetre.

Bray all well together in a paste, in a mortar, and form it into a ball. The above is only for one dose, but you may make as many as you think proper at once, and keep them for use. Give them at night, and they will work off the next day. These balls are of great service in many of the disorders of horses, and are some of the best staling balls yet found out.

By following the foregoing directions, a cure will generally be performed. Sometimes in this disorder little knots break out, especially upon the hind parts of the horse, and these knots throw out a little matter. When this is the case, you must rub them with strong mercurial ointment. Sometimes these little tubes, or pustules, have living insects in them; but, by rubbing them as I have just directed you, they will be destroyed and the cure completed.

The Hidebound.—This disorder is too often brought on by the horse being worked too hard, and badly kept; although this is not always the case. When the skin of a horse sticks so close to his ribs that it appears immovable, the horse is said to be hidebound. But this is not properly a disease, but rather a symptom, being often caused by previous disorders, such as fevers, convulsions, surfeits, worms, or disorders of the kidneys or lungs.

CURE.—As the hidebound may proceed from various causes, it is necessary to determine the cause, before such medicines can be applied as will remove it. If it owe its origin to hard labor and want of food, rest and plenty will soon remove it. If it be caused by worms, worm medicines must be applied; or if it be left by any imperfectly cured disorder, the following drink must be given:

2 ounces of aniseeds in powder.
2 ounces of ginger, in powder.
2 ounces of mustard.
2 ounces of turmeric.

All to be powdered, and to be given in warm ale, fasting, and to fast two hours after. Bleeding, tapping and physic are also necessary, when the hidebound is left by any disorder.

The Mange.—This disorder is more shameful than dangerous, for you cannot go abroad with a scabby horse without being hissed at, neither is it proper; for this disease is so infectious that every horse that may come near it will be in danger.

The mange is too well known to need a long description, though some have been mistaken, and have taken a hot itching eruption for it.

SYMPTOMS.—At first it is confined to the skin, but, by long continuance, it vitiates and pollutes the blood. The skin is generally thick and full of wrinkles, especially about the mane, the loins and the tail; and the little hair remaining on those parts stands erect. The ears and eyebrows are commonly naked; and, when the limbs are affected, they have the same appearance; but, at the same time, the horse is not raw nor does the skin peel off as in a surfeit.

CAUSES.—The mange is generally taken by infection, for it is so very catching that if a horse be put into a stable where one with the mange has stood, before it is thoroughly cleansed, he will hardly fail being infected. But, though infection is the general, it is not the only cause, of the mange. Low feeding, and running long abroad in cold, pinching weather without sufficient provender, will cause a horse to have the mange.

CURE.—When a horse has been infected by another, the

disorder is not so obstinate as when caused by starvation, for the blood will not be in so bad a state. When you think a horse has got the mange, apply the following, where you think it needful, and it will cure it at the beginning, without much trouble or expense:

4 ounces of sulphur vivum.
4 ounces of white copperas.
4 ounces of white hellebore root, in powder.

Mix all together in two quarts of buttermilk, and rub the places well. By this method you can cure most scabs of short duration; but, when once the mange has got great hold, it will require sharper treatment. Make the following for one horse:

4 ounces of sulphur vivum.
2 ounces of white hellebore root, in powder.
2 ounces of blue stone vitriol, in powder.
½ ounce of verdigris, in powder.
4 ounces of Flanders oil of bays.
3 gills of whale oil.

Mix all well together, and rub the horse well with it all over—in the sun, if in summer, but before a fire if in the winter. In summer you must always turn him out to grass after rubbing, but in winter keep him warm in the house. You must be careful to wash your saddles and bridles, cart gears, stands, mangers, racks, etc., well with quick-lime and chamberley; for, if you do not clean all that the horse may have used, the infection will remain. You will find the above a certain cure, if managed rightly, for I have cured hundreds with it, and I do not remember one instance of its failure.

At the same time give freely of flour of sulphur and liver of antimony; and, if you have a number of horses infected, be sure to rub them all together.

The Farcy, or Farcin.—There have been many opinions respecting this disease. Some authors reckon five kinds; but although there are so many different branches, yet four of them have the same root. The water farcy is different from the others, and, therefore, I shall put it afterwards by itself. There is a scurvy which horses are subject to, and which is often called a farcy, but it is no such thing, for there are only the two kinds of farcy which I shall here treat upon. Horses are often said to have the farcy when they have not, for sometimes when people do not know the proper name of a disorder, they call it farcy. The true farcy is a disorder of the blood vessels, and generally follows the course of the veins, and, when inveterate, thickens their coats and integuments in such a manner that they become like so many cords.

Symptoms.—At the beginning of this disorder, a few small knobs or tumors, resembling grapes, are found on the veins, which are so painful to the touch that the creature shows evi-

dent marks of uneasiness on their being pressed with the finger. They are at first very hard, like unripe grapes, but in a very little time they grow soft, and break and discharge a bloody matter, and become very foul and untoward ulcers. This disease appears in different places on different horses. Some show it first on the head; some on the external jugular vein; some on the plate vein, extending from thence downward, on the inside of the fore leg, towards the knee, or upwards towards the brisket. In some it first appears about the pasterns, on the sides of the large veins, and on the insides of the thighs, extending towards the groin; in others on the flanks, spreading by degrees towards the lower belly; and some horses are nearly covered all over the body at once.

CURE.—When the farcy attacks only one part of a horse, and that where the blood vessels are small, it may be easily cured; but when the plate vein is affected and turns corded, and especially when the crural veins withinside the thigh are in that condition, the cure is very difficult, and the creature is rarely fit for anything but the lowest work after it. Therefore, those who depend on some particular medicine, and flatter themselves with being able to cure every species of the farcy with it, will find themselves wretchedly mistaken; for different medicines are needful, according as the disease is superficial or inveterate. The former is easily cured, for sometimes moderate exercise is sufficient; but the latter requires knowledge and experience, and often baffles the most skillful and defies the whole power of medicine.

From the above description of this disease, it appears that it is of the inflammatory kind, and that the blood vessels are affected. Copious bleedings are, therefore, absolutely necessary, especially if the horse be fat and full of blood. This evacuation always checks the progress of the farcy in its beginning, but its good effects soon vanish, especially if the horse be low in flesh. After bleeding, mix the following:

4 ounces of cream of tartar.
4 ounces of lenitive electuary.
4 ounces of Castile soap.
2 drachms of calomel, 8 drachms to an ounce.

Make these into balls, and give two ounces a day for some time. While giving these balls, dissolve a little nitre in the water given to the horse to drink. These medicines will keep his body open, and allay the inflammatory heat of his blood, which is the principal cause of the disease; and, while they are given inwardly to remove the cause, let the tumors be rubbed twice a day with the following ointment:

4 ounces of elder ointment.
4 ounces of Flanders oil of bays.
2 ounces of white vitriol.
1 ounce of red precipitate.
2 ounces of sugar of lead.

Beat all well together into an ointment, and keep it for use. This ointment will soon disperse the tumors, which will leave small bald spots on the skin, but the hair will grow again in time. If the tumors break, and run a thick, well digested matter, it is a sign that the disease is conquered, and the horse will soon be well; but it will be necessary to give him two ounces of liver of antimony every day for a fortnight, and two ounces every other day for a fortnight after, in order to sweeten his blood, and disperse the small bunches that remain. This method never fails when the small veins only are affected; and a short time will complete the cure.

But when the farcy affects the large blood vessels, the cure is far more difficult. Let the practitioner always attempt it at the beginning of the disease, as he then will have fewer difficulties to encounter; for delay renders that almost impossible to be overcome which at first might have been easily conquered. Therefore, when the plate or crural veins are corded, lose no time, but bleed immediately on the opposite side, and apply to the distempered vein the following mixture, which is proper to dress the wound with, but not before they are broken out:

3 drachm of corrosive sublimate.
1 ounce of spirits of salt.

Powder the sublimate, and put into a bottle, and put the spirits of salt upon it to dissolve it; then add two ounces of vinegar by degrees. This is a very proper mixture to dress the ulcers with; but, if it cannot be got, take

6 ounces of oil of turpentine.
3 ounces of oil of vitriol.

Put the pot in water with the turpentine in it, and pour the oil of vitriol in, a little at a time, and keep stirring it till it shall have subsided. If the farcy be situated in the loose and fleshy parts, such as the flanks and belly, the mixture should consist of equal parts of oil of turpentine and oil of vitriol; but when the seat of the disease is in the parts which are less fleshy, the proportions above are best calculated to perform a cure. The medicine must be used in the following manner: Rub the parts affected with a woolen cloth, and then apply some of the compound oil to every bud and tumor. Continue this method twice a day, and at the same time give cooling physic every other day. The balls and nitrous draughts before mentioned will answer the intention. By this treatment the tumors will be digested, and the cords dissolved; but it will be necessary to give liver of antimony to complete the cure, and to prevent a relapse; and also to dress the sores, when well digested, with a mixture of bees-wax and oil, which will heal them, and smooth the skin.

Sometimes the disease will not yield to this treatment,

especially when situated near the flanks or the lower belly. In that case it will be necessary to bathe the parts with the compound oil as far as the centre of the belly; and at the same time to give a course of antimonial medicines. The following composition is stronger than the last, and on that account is often used when the disease is obstinate:

4 ounces of spirits of wine.
2 ounces of oil of turpentine.
4 ounces of oil of vitriol.
2 ounces of vinegar.

Mix all together with the caution before directed. When this method fails, and the disorder becomes inveterate, try the following, which is recommended by an eminent practitioner:

½ pint of linseed oil.
3 ounces of oil of turpentine.
2 ounces of oil of bays.
½ ounce of oil of origanum.
½ ounce of strong aquafortis.
2 ounces of Barbadoes tar.
1 drachm of tincture of euphorbium.

Mix all together with caution, as before directed. This medicine must be rubbed on the tumors and corded veins once in two or three days, observing that if the mouths of the ulcers are choked up, or so thick as to confine the matter, to open a passage with a small hot iron; and also to destroy the proud flesh, which may be kept down by touching it occasionally with oil of vitriol, aquafortis or butter of antimony.

In this disorder, these are the best ways of proceeding that have yet been discovered; but it is to be considered as an obstinate one, and is sometimes very hard to cure. It has hitherto baffled many an able practitioner, and it is to be feared will baffle many more; for when the blood has got into such a corrupted state, it bids defiance to medicines.

The ingenious Dr. Brackden recommends the strong mercurial ointment for rubbing the cords and tumors with before they break; and, in order to disperse them when they are broken, to dress the sores with a mixture composed of equal parts of Venice turpentine and quicksilver. If the mouth becomes sore by this means, a gentle purge should be given to prevent salivation. This is doubtless a very good method, and, if care be taken, will often prove effectual.

I have given you the best prescriptions that I am able to give, and such as will not fail to cure if properly applied, if the horse be not incurable. I have been more particular in treating of this disease, because it is common among horses, and very often managed improperly by those who pretend to cure it. Such, therefore, as have valuable horses in this disease, would do well to be careful whom they employ, and assiduous in observing the methods they make use of to cure it, if they do not think proper to attempt a cure themselves. In my

opinion they may do it better themselves by following these directions than by trusting to farriers.

The Water Farcy.—This disease varies very much from the last, and would more properly be called a dropsy than a farcy. There are two kinds of this disorder, but they are nearly of the same nature. One of them is produced by indisposition terminating in the skin, as is often the case in epidemical colds; the other is a true dropsy, where the water is not confined to the body and limbs, but is found in different parts of the body, and a great number of soft swellings appear. When you press the finger pretty hard upon any of the swelled parts, or under the horse's belly, or any part of the body, you may take it for granted that he has got the dropsy, or what is called the water farcy.

This disorder mostly proceeds from foul feeding, or a continuance of very wet weather in the end of summer.

CURE.—Whenever the swellings appear, make scarifications, that is, holes through the skin. This may be done by a short fleam; and if you have not one short enough, put a collar made of a piece of leather on it. If the swelling be under the belly, strike a good many holes in at a time, but be careful to avoid the veins. By this means a great quantity of water will run out. Taps in the brisket are also often of great service. I have fleamed horses four or five times before I could get the swelling to subside. When the water has subsided, the blood is left in a bad state, to remedy which a gentle purge should be given two or three times, eight days' distance, to recover the crasis of the blood, and brace up the relaxed fibres of the whole body. Lime water is very proper, with a little nitre in it, and let the horse's food be warm mashes or bran, with a little malt in it. His keep must be increased by degrees. The disorder mostly happens to young horses that have not been used to high keep. You must give one of the following balls every day, omitting the time when the physic is working:

2 ounces of squills.
1 ounce of camphor.
1 ounce of Castile soap.
1½ ounces of turpentine.
4 ounces of yellow resin.

Make these into a ball with honey, and give one ounce at a time. These balls will work the water off by urine. When the horse has been treated in this manner till the water is evacuated, and he begins to recover, give him a pint of the following infusion every day for a fortnight, fasting, and let him fast one hour after each dose:

4 ounces of gentian root.
4 ounces of black hellebore.
2 ounces of Jesuit's bark.
4 ounces of camomile flowers.
1 handful of centaury.

Boil all together in six quarts of water, for ten minutes; let stand till cool, and then strain it through a cloth. This strengthening drink will brace the fibres, cause the fluids to circulate quicker, and complete the cure.

Founders.—The chest founder is produced by violent exercise on a full stomach, and drinking large quantities of cold branch water; by the use of mouldy bran, corn, or oats, or by eating large quantities of green food, such as oats, wheat, peas, etc., while performing hard labor. The seat of the disease is in the lungs; the heart and liver are also considerably enlarged, insomuch that there is not room for them to perform their office with ease. The liver, lungs, diaphragm and surrounding parts, are all covered with large brown spots, and are much inflamed.

Symptoms.—A horse that is chest foundered will straddle or stake with his fore legs, showing an unwillingness to bring his feet together; and, if they are placed near each other, he will not permit them to remain so for a minute. Indeed, they are frequently twelve or eighteen inches apart, which is caused by a fulness and continual uneasiness about the chest; the cavity being too small to contain the lungs, etc., in their enlarged situation, with ease. The hind legs are free from the palsied appearance of those before, and it is not difficult to distinguish it from a common founder, as it is wanting in all its symptoms, except the stiff and numbed appearance of the legs.

Large bleedings, and half an ounce of aloes, given internally in a ball, have sometimes afforded momentary relief. A horse laboring under this disease is worth but little more than his board, as he is unable to bear fatigue, or undergo severe service.

The common founder is caused by riding the horse until much heated and fatigued, and then allowing him to cool suddenly, by drinking freely of cold water, or standing in an exposed situation, or in a cold stable without covering; or, without sudden cooling, it may be produced by too bountiful feeding, and his swallowing his food greedily, while very warm and hungry. Under such unfavorable circumstances, the poor animal, after resting, instead of being refreshed, is stiff and sore; his rest, food, and drink, being more destructive to health than constant action and abstinence. On the contrary, had he been allowed to cool gradually, and fed sparingly, he would have escaped injury.

Cure.—Take from the neck vein a gallon of blood, and give as a drink, in a quart of strong sassafras tea, a tablespoonful of saltpetre, and a quarter of an ounce of assafœtida; withholding any drink for six hours; at the end of which, should

he not be better, take half the quantity of blood, repeat the drink, offering him bran or oats scalded with sassafras tea, his drink being mixed with tea. His feet should be well cleansed, and filled with cow dung.

Other Remedies.—As soon as your horse is foundered, bleed him in the neck in proportion to the severity of the case. In extreme cases, bleed him as long as he can stand. Then draw his head up, and, with a spoon, lay salt back on his tongue, till he has swallowed one pint. Let him drink only moderately. Anoint his feet with spirits of turpentine, and he will soon be well. The founder pervades every part of the system. Bleeding arrests it in the blood, and the salt in the stomach and bowels. Attend to it immediately after the injury.

The Prairie Farmer recommends, as a simple and certain cure, to bleed the horse freely in the neck, as soon as the founder is discovered, and as soon as practicable, place him in water, about up to his belly—the colder the better—and let him stand two-thirds of a day; or, if badly foundered, longer. This drives the founder from his feet and legs, and prevents its settling there.

Poll Evil.—This disease in the horse proceeds sometimes from striking the poll of his head against any hard substance, or from bruising the part with the halter, which causes it to swell. First abate the inflammation, by bleeding, physic, and the application of cold lotions to the part. This will sometimes disperse the swelling. If it matters, hasten its formation with warm fomentations, poultices, or stimulating embrocations; then open the swelling so that the whole of the matter should run out, and continue to do so. This is done by a seton. Keep it clean with warm water. A piece of the skin of old bacon, rubbed on with a hot iron, is a good application. Poll Evil has been cured by the following mixture (apparently, at least, by it in some instances): Take finely pulverized flint glass, three spoonsful, put into urine one pint in a bottle, and bury it in the ground for three or four days; after which, take one spoonful or more of the mixture, well shaken up, and put that much into each ear, once a day, for three, four, or five days.

A Sprain in the Back.—All kinds of sprains resemble each other. They are a relaxation of the tendinous fibres, from the muscular parts being overstretched. Sprains in the back are mostly caused by overweighting the horse, or by his losing his hind feet on the side of the hill; and, sometimes, by putting him back too quickly. There is much difference between a sprain in the back, and what is called tifled in the back. Sometimes a horse catches cold in his loins by having his clothes on

his saddle taken off when he is hot, and being turned out of doors; and some horses are subject to rheumatics, which make them lame in many places, and are generally taken for sprains.

To cure a sprain in the back, first bleed pretty freely, and then give the following drink:

1 ounce of tincture of guaiacum.
1 ounce of balsam copaiva.
1 ounce of oil of juniper.

To be put into a quart of strong parsley-root tea; half to be given at night, half in the morning, and plenty of warm water to work them off.

Also, lay a sheep's skin with the flesh side to his loins for six or eight hours, if he can bear it; and then turn the wool side to him, and let it stay on a day; and, when you take it off, sheet him well for fear of catching cold.

A Sprain in the Shoulder.—When the shoulder of a horse is sprained, he does not put out the leg like the other, but, in order to ease it, sets the sound foot firmly on the ground. When trotted in hand he forms a kind of circle with his lame leg, instead of putting it forward, and when he stands in the stable that leg is advanced before the other.

There is what is called a shoulder-slip, which is worse than a sprain. When this happens, the horse can neither lift his leg nor put it forward. You may know this by the shoulder-blade standing higher than the other; but, to discern that, you must make him stand on the lame leg, for the leg he stands on will always appear a little higher than the other. The flesh will also shortly waste away from the shoulder-blade, which is a sure sign of a shoulder-slip. When the accident has taken place, put a tap in the lame side of the animal's breast, and blow the shoulder full of wind with a pipe. When you have rinded the skin to put the tap in, hold the skin fast to the pipe, and blow the part that you have rinded full, and let some one draw the wind up into the shoulder with the edge of his hand as far as the top of the shoulder-blade, and then put in the tap, or rowel, and stop the hole up well with tow and salve. Give warm water for three days, and then open the place, stir the tap round, and rub the shoulder all over with the following liniment:

2 ounces of spirits of wine.
2 ounces of sweet oil.
2 ounces of spirits of sal ammoniac.

Shake them well together, rub the shoulder well with the mixture every third day, for some time, and if the horse do not get better, with three or four times rubbing, use the following:

2 ounces of oil of turpentine.
1 ounce of oil of origanum.

Shake these up together, rub all on at a time, and walk the

horse about a little afterwards. When near the sea, swimming in the salt water is very proper, and I have known swimming in fresh water to be of great use, particularly in clear running streams.

A sprain in the shoulder point requires nearly the same treatment as a slip, but you need not blow it. When it is attended by inflammation, cooling mixtures, such as extract of lead and water, must be used. But when a swelling or an inflammation takes place, it is mostly caused by a hurt, or by a stroke from another horse. If there be no swelling, rub the shoulder point well with the following mixture every third day:

1 ounce of oil of amber.
1 ounce of oil of spike.
1 ounce of oil of origanum.

Shake these well together, and rub the shoulder point every other day. If the horse be no better, take

1 ounce of oil of turpentine.
1 ounce of oil of origanum.
1 ounce of oil of amber.

Shake these together, and rub the shoulder point well with them every third day; and, if the horse continue lame, recourse must be had to blistering.

A Sprain in the Coffin Joint.—This is often a grievous disease, and it is difficult to discover where the lameness is. It is often neglected till the joint grows stiff, and then the horse pitches upon his toe, and is afraid of bearing any weight upon his foot. If you press with your thumb in the hole in the horse's heel, and upon the cornet of his foot, you will soon discover whether the hurt is in the coffin joint.

When people cannot tell the cause of a horse's lameness, they often say that he has got sprained in the coffin. In my opinion it is better not to doctor a horse than to apply stuff to you know not what. If people would have a little patience, most lamenesses would soon show themselves, especially a sprain in the coffin joint, for it would raise a ring round the corner of the foot, not much unlike a ring-bone, but closer to the foot.

The first thing to be done is to draw a little blood from the spurn vein, then mix an equal quantity of oil of bays, or oil of origanum, beat well together, and rub well all round, just above the hoof. Apply this for three or four days together, and if no better, you must have recourse to repeated blistering.

A Sprain in the Back Sinews.—This kind of sprain is more frequent among horses than any other, and is so common that I need not describe it, but only inform you how to cure it.

If it be recent, bathe the leg with a little hot vinegar, or

verjuice, with a little saltpetre dissolved in it, and put round it a proper bandage; or, curriers' shavings, wetted with a composition made of vinegar, spirits of wine, and a little tar, and laid on the swelling, with a pretty tight bandage round them, will be of great use. Take it off once a day, and soak the shavings again, or get fresh. Injuries of this kind must not be expected to be removed immediately. Rest is absolutely necessary, and turning the horse out to grass would be of great service as soon as the swelling disappears, but not before. If these methods fail, the next thing is to blister; for I have known blistering to succeed when all the former have failed. The last thing to have recourse to, is firing; and this must be done carefully, and by some experienced person.

Sprains of the Knees and Pasterns.—The knees are liable to many misfortunes besides sprains. The speedy cut is done by striking one foot against the other leg, just below the knee, and is frequently done by a horse that trots high. Sometimes it swells very much, and is taken for a sprain. Sometimes horses get kicked by others, or meet with some other accident, which causes a swelled knee, which is sometimes bad to remove. A poultice, made as follows, and carefully applied to the part injured, will have a great tendency to remove the swelling:

Take 4 ounces of tar.
4 ounces of spirits of wine.
3 ounces of hogs' lard.

Melt these together over a slow fire, and be careful not to set fire to them, and put in as much linseed meal as will make them of proper consistence. This is a very good poultice for many kinds of swellings, and, although but little known hitherto, I hope that it will be found of great service. If any substance be left, which will not give way to this method, you must lay on a little blistering ointment

Lameness in the Stifle.—The stifle is the tenderest part of a horse, except the eye. How many horses have lost their lives by misfortune in this part, and how many have been left lame by not being properly cured! A horse that is lame in the stifle generally treads on his toe, and cannot set his heel to the ground without great pain and difficulty. When you find this is the case, bathe the part well with warm vinegar; and if a puny swelling appear, foment it well with a woolen cloth, wrung out of hot vinegar, wormwood and rosemary, having added half a pint of spirits of wine to a quart of the decoction. Let this operation be continued till the swelling is nearly gone.

Owners of horses should watch closely for this lameness. They cannot be too careful of the feet of their animals. You

should examine the feet of your horses frequently, and with much minuteness.

When a horse has got a stroke, and cut by the heel of his shoe, great care must be taken to keep out the cold air, and to keep him from drinking cold water, especially in winter time; for, if the horse take cold, and an inflammation come on, there is reason to fear that death will follow. When you perceive that a horse has got a stroke, and is cut through the skin, bathe it well with the following mixture:

2 ounces of spirits of wine.
1 ounce of spirits of sal ammoniac.
1 ounce of oil of amber.

Shake all well together, bathe the place well with it, and lay on a diachylon plaster with gum, in order to keep out the cold. If the horse grow very lame, and the place swell much, foment with the following:

Take a handful each of wormwood,
elder leaves, camomile flowers,
juniper berries, marshmallow leaves,
boil in 2 gallons of chamber ley.

If the above cannot all be got, take double the quantity of juniper berries and camomile flowers, and foment for some time, as before directed; and, when you leave off fomenting, rub with the above mixture. Be careful to wrap the part up warm, and, as soon as it comes to matter, dress it with basilicon ointment. If any brown lee appear, syringe tincture of benjamin, or balm drops, into the wound. When a callous substance, or proud flesh, appears, cut it off with red precipitate. These are the best ways of curing a horse that has got lamed in the stifle.

Lameness in the Cup-bone, or Whirlebone.—A lameness in this part of the hip is discovered by the horse dragging his leg after him, and dropping backwards on his heel when he trots. If the muscles of the hips only are injured, the lameness may be soon cured; but, if the ligaments of the cup are affected, or relaxed, the cure is often very tedious; and, when the cup is full of glueish liquor, the cure is doubtful. I have known the ligament, which holds the hip bone in the cup, to be broken, and then the hip bone has come loose; but this seldom happens, and when it does, nothing can be done to relieve it. When a horse is lame in the cup bone, rub him well with the following mixture.

1 ounce of oil of amber.
½ ounce of oil of origanum.
1 ounce of oil of turpentine.

Shake these well up, rub one-half on the cup, and the other half the third day. I have known this mixture to remove the complaint when of long standing; but, if it fail, you must

try what blistering will do. The last thing to be tried is firing. I have fired horses that have been lame above a year, and cured them by it.

It is very easy to fire a horse in this part. Take the iron and make a circle, eight inches in diameter, like a cart wheel, with scores about an inch asunder. Cut nearly through the skin; and if you do cut through in some places, it will be no worse.

Sprains in the fetlock, or anywhere in the limbs, may be treated in the same manner, and if the oils will not remove the substance, blisters will; therefore, I shall give you a recipe for a blister, which is not only suitable for those complaints, but for others where a blister is wanted:

Take ½ ounce of quicksilver.
½ ounce of Venice turpentine.
2 ounces of Flanders oil of bays.
½ ounce of gum euphorbium.
1 ounce of Spanish flies.
2 drachms of oil of origanum.

Rub the Venice turpentine and quicksilver well in a mortar for some time, and then put in the oil of bays, and rub some time longer, till the quicksilver is quite killed. Powder the gum and flies well, and mix them all together. When you lay the blister on, rub it well against the hair, to get it to the bottom; lay it on with a broad pointed knife, and cover it with a cloth, or the horse will get his mouth to it. This blister will answer any purpose you want a blister for, but you must observe that there must be fifteen days between the times of laying it on.

The Bone-Spavin.—Although this is a common disorder among horses, yet it is little understood by either breeders or farriers. The bone-spavin is a bony excrescence, or hard swelling, on the inside of the hock of a horse's leg, and sometimes owes it origin to kicks and blows, and, sometimes, to natural causes; but, in the former case, it is much more easily cured than in the latter; and those that grow spontaneously on colts, or young horses, are not so bad as those that appear in horses that have arrived at their full strength and maturity. In old horses they are generally incurable.

Sometimes the horse is very lame when the spavin is first coming out, and when it has come out, is better for some time, and then grows lamer again as the bone hardens. I would advise you to apply a blister as soon as you have any suspicion that a horse is likely to put out a spavin, and to continue blistering, every fortnight, for some time, by which means you may stop a spavin in a young horse.

CURE.—Mild medicines should be used if the horse is young, as they will in a short time wear the tumor down by degrees, which is much better than trying to remove it at once

by severer methods, which often have a very bad effect, and produce worse consequences than those they were intended to remove. But in full grown horses other treatment is necessary. The following ointment is probably the best that can be used :

2 ounces of cantharides.
4 ounces of mercurial ointment.
3 ounces of tincture of iodine.
4 ounces of turpentine.
3 drachms of corrosive sublimate.
Mix with two pounds of lard.

Cut off the hair from the parts affected, and grease thoroughly with the ointment thus made, rubbing it well in with the naked hand. Let it remain two days and then grease the part with lard. In two days more wash it off with soap and water, and then apply the ointment again. Continue this till a cure is effected. By this means, bone-spavin may often be cured; but when they fail, recourse must be had to firing.

Before you fire a horse for the bone spavin, be careful to take the vein out of the way, for it generally lies over the spavin, and you cannot fire deep enough to come at the callous substance without its removal. In order to destroy the vein, cut a nick through the skin upon it, just below the spavin, and another just above it, and put a crooked needle under the vein, and tie both ends; then cut the vein across between the tyings, both above and below, and you may either draw the piece of the vein out, or leave it in. Let the iron you fire with be pretty sharp; cut four or five nicks upon the bone, and let the iron take hold of the superfluous bone, in order that it may waste away by mattering; and when you have done, lay on some white pitch, pretty hot, and put a cloth around it to keep it on. In three days open the place, and dress it with yellow basilicon.

The Blood-Spavin, or Bog-Spavin.—Many farriers and horse-dealers divide this disease into two heads, and give them different names; but, to my certain knowledge, they are both one, for I have proved it in many ways. A blood-spavin does not come by breeding from spavined mares, nor by being got by spavined horses, as the bone-spavin does; but you may safely breed out of a blood-spavined mare, or have the foals got by a blood-spavined horse. In my opinion, blood-spavins are generally brought on either by sprains, or by hard labor when the horse is young, and sometimes when he is full grown.

The blood-spavin, or bog-spavin, is a dilation of the vein that runs along the inside of the hock, and forms a small soft swelling in the hollow part, which in time renders the creature lame, but seldom till the gelatinous matter becomes ropy, like melted glue in a bag, and is situate on the inside of the hough.

Sometimes it goes through the back part of the joint, and then it is called a thorough-pin.

CURE.—Soon as you discover the vein puffed up, or forming a bag, lay on some blistering ointment, and in four days after bathe the swelling with hot vinegar, with a little saltpeter dissolved in it. Also put a bandage round it to disperse the swelling as much as you can. If this method do not succeed, you must make two incisions in the skin lengthwise, as the vein runs, one just above, and the other just below, the joint, and lay the vein bare; then put the end of a buck's horn under it, raise it up, and fasten it in both places with waxed thread; then cut the vein in two at both places within the tyings, and, if you think proper, draw the vein out. This method of proceeding will cure most bog-spavins at the beginning. The blood-spavin may also be cured by applying the same ointment used in bone-spavin, only it should be applied once in six days instead of once in four. This spavin ointment is very powerful, and when properly used is the best ever invented.

A Corb.—This is a soft swelling that rises out of the joint, on the back part of the hind leg, just below the hock, and mostly lames the horse, besides being unpleasant to the eye. To cure it, strike a few holes into it with a pricker, made so as just to go through the skin, then rub well with oil of origanum, and blister as often as needful. If this will not answer, use the spavin ointment once in six days.

A Ring-Bone.—This is so well known that I need not describe it, but only point out the remedy; yet I must observe that a sprain in the coffin is sometimes taken for a ring-bone, when it causes a rim to rise just above the foot. Ring-bones come out from the pastern, between the fetlock and the foot; but if the pastern is long, they are nearer the foot. They will generally yield to the same method of cure as a corb, especially if just coming out, but if not, use the spavin ointment in same manner as in bone-spavin, only do not apply it so often. Once in six days is often enough.

Mallenders and Sallenders.—The first is on the fore leg at the bend of the knee, and the last on the hind leg at the bend of the hough. They crack and throw out a thin brown matter, and, sometimes, a hard scurf, or scab, which prevents the horse from bending the limbs which are affected, as he should do.

CURE.—They both proceed from the same cause, and consequently require the same treatment, which consists in washing the parts with old chamber-ley, or a warm lather of soapsuds, and afterwards applying strong mercurial ointment, spread on tow, to the cracks, once a day, till the scabs fall off,

when the cure will be complete; and then it will be necessary to give him a dose or two of physic. If the disorder will not yield to the mercurial ointment, make a strong mixture of vitriol water, and wash the cracks with it, and it will dry them up, and cause the scabs to fall off.

The Strangles.—Most horses have this disorder while young, but at seven years old they are out of danger. There are two kinds of this disorder. The common kind is a swelling under or between the jaw bones. The other, which is called the bastard kind, is much the worst. Sometimes swellings appear on the buttocks, break and discharge matter for a few days, and then dry up, after which others appear in a fresh place in the same manner. I have known horses that have had this complaint eight or ten weeks. The common kind begins with a swelling between the jaw bones, which sometimes extends to the muscles of the tongue, and is often attended with so much heat, pain and inflammation, that before the matter is formed, the creature swallows with the utmost difficulty.

Symptoms.—The strangles is attended with great heat and fever, a painful cough, and great inclination to drink, without being able. Some horses lose their appetites entirely, and others eat but very little, occasioned by the pain resulting from the motion of the jaws in chewing and swallowing. When the horse runs much at the nose, it is not a good sign. Although this disease is very troublesome, it is not dangerous, except when the swelling turns upwards against the windpipe and gullet, and then there is danger of suffocation if it do not break soon.

Cure.—The strangles is not properly a disease, but a discharge common to young horses, and, therefore, it follows that the discharge must be promoted in order to throw off the offensive matter. The best method of doing this is to keep the swelling always soft by soaking it with softening ointment, such as marshmallows or elder ointment. I have known oil of swallows, with a little spirit of hartshorn in it, to be very useful in bringing the swelling forward and causing it to break. A cloth in the form of a cap, put on the horse's head, and stuffed with wool to keep the swelling warm, will be of great service. Some people apply a poultice, but there is no need of this if the above be properly used. Give plenty of warm water, with a little meal in it; for in this disorder a horse cannot swallow dry food enough for its support. When they gather and break, see that the matter runs freely; if not, open them with the point of a sharp knife. It will be five or six days before they break.

When the swelling is broken, and orifice of a proper size to discharge the matter, dress with the following ointment spread on tow:

Take 1 pound of yellow resin.
1 pound of Burgundy pitch.
½ pound of honey.
½ pound of common turpentine.
1½ pounds of hog's lard.
4 ounces of beeswax.
1 ounce of verdigris, finely powdered.

Melt the ingredients together, but do not put the verdigris in till nearly cold, and keep stirring all the time till cold, or the verdigris will fall to the bottom. This is one of the best salves for wounds that has been found out, and especially for old ones.

The bastard strangles requires the same kind of treatment, but it is proper to give the horse some calomel physic also.

The Glanders.—This disease has baffled all who have tried to cure it, and probably will do so to the end of time; so I advise those who may have a glandered horse, to put him off as soon as they shall be certain that he is so. People often mistake other disorders for the glanders. A violent cold sometimes causes a running at the nostrils, and kernels under the jaws, when the horse is free from the glanders. Sometimes a running at the nostrils is caused by laying too much weight on a horse. I do not pretend to cure glanders.

Symptoms.—The matter discharged from the nostrils of a glandered horse, is either white, yellow, greenish, or streaked, or tinged with blood. When the disease has been of long standing, and the bones are fouled, the matter turns blackish and becomes very bad. The glanders is always attended with a swelling of the kernels, or glands, under the jaws, but in every other respect the horse is generally healthy and sound, till the disorder has continued some time, and the morbid matter has effected other parts. If a thin, limpid fluid be first discharged, and afterwards a whitish matter—if the gland under the jaw do not continue to swell, and the disorder shall have been but recently contracted, a speedy cure may be effected by applying the following:

1 ounce of roach alum.
1 ounce of white vitriol.

Powder these well, put them into a pint of warm vinegar, and syringe about an ounce up his nostrils every day. This may do good if the disorder be newly caught.

Swellings and Imposthumes.—When a swelling is in its first stage, bathe it well with verjuice or vinegar, with a little saltpetre dissolved in it; and if the swelling still continue, mix

1 ounce of extract of lead.
1 ounce of spirits of wine.
1 ounce of spirits of sal ammoniac.
3 ounces of vinegar.

Rub the swelling well with it; but if it be very hot, add four ounces of water instead of the vinegar. Should the swelling come forward and form matter, which you may feel by the pressure of your finger, let the matter out, but be sure to make the incision large enough that you may dress it with ease. When you have laid the part open, dress it with the green salve before recommended, on tow, for you cannot have a more proper salve. The next time you dress it, that is, the day after, make a wash of the following:

2 ounces of spirits of wine.
2 ounces of spirits of rosemary
1 ounce of roach alum.
2 ounces of water.

Mix these all together, and they will answer the purpose extremely well. When you have washed the wound with the above mixture, lay on a little green salve, on tow, and bind it on if you can, but if you cannot, lay on a plaster to keep it on.

Some swellings, such as have been caused by bad barfens on the shoulders, or blows on the legs, will not submit to weak mixtures, nor come to matter in a reasonable time. Mix the following, and it will either take them off or bring them to matter:

2 ounces of oil of spike.
1 ounce of oil of amber.
½ ounce of oil of origanum.
1 ounce of oil of turpentine.

Mix these well together, and rub the swelling well with them every other day. I have known this to remove obstinate swellings.

Wounds.—Wounds are caused by accidents of various kinds. When the skin is much torn from the flesh, if you are at hand while the wound is quite fresh, take a square-pointed needle and a waxed thread, and sew it up. Mind to put the needle in straight, one side over against the other; draw the skin tight, and tie a knot; cut off the thread, and then take another stitch about an inch off, and so proceed. When same people sew up a wound, they do it the same as they would sew up a piece of cloth, but that is quite wrong, for they should tie a knot at every stitch, and cut the thread off. But when you do not see the wound until the place is growing dead, and the skin is drawing up, then take off the loose skin; for if you keep it on it will curl up, and leave a blemish. Always keep the lips of the wound down.

When a wound is upon or near a joint, there is danger of throwing out a joint-lee, of which there are three kinds. One,

and mostly the first, is thin and brown, something like sweet wort; the second is rather thicker and tougher, something like melted glue; and the third, which is the worst, is like muddy water and snort mixed together. This last has deceived many people, for when the wound has thrown out this kind of lee, with little, white slippery pieces, something like matter, it has often been taken for such. When you find any of these kinds of lee, get a bottle of Riga Balsam, and syringe the wound every day. If Riga Balsam can not be got, use the tincture of benjamin. I have known fomentations to be of great use, especially on the stifle joint. When a wound is of a dead color, and the lips rise, and the dirty lee flows profusely, the cure is to be despaired of. If proud flesh arise when a wound is in a fair way for healing, take

1 ounce of basilicon.
2 drachms of red precipitate.

Mix them well together, and lay them on the proud flesh. This ointment is also very proper to dress a wound with that appears dead, and does not discharge a proper matter. If the proud flesh do not submit to the above, lay on a little blue vitriol, in powder, or touch it with caustic or oil of vitriol; and should none of these make it give way, lay on a little corrosive sublimate. The salves, tinctures, and mixtures already laid down, are sufficient to cure any curable wound.

Hurts in the Feet.—Horses are oftener hurt in the feet than anywhere else, and those hurts are often received from the blacksmith. Every blacksmith should be a farrier, and every farrier a blacksmith, for these businesses should go hand in hand. Sometimes a horse is lamed by being shod into the quick. The foot should always be carefully examined on the first appearance of lameness. Sometimes a nail with a flaw in it will cause a great grievance, as one part will come out and the other will go into the foot. Blacksmiths should never use such nails except in a frost, when they can put them into the old holes. Sometimes they leave stumps, or pieces of nails, in the feet; and sometimes when they drive a nail they turn the point into the foot, and then draw it back and put in another, take no further thought about it, and when the horse becomes lame, they say he is gravelled.

When a horse has got lamed in the foot, be careful to cut it well out, and to damage the hoof as little as possible, and dress the place with oil of turpentine, spirits of tar, and common tar. Lap no hot drying drugs on, unless proud flesh rise.

Sometimes corns on the heels cause a horse to be lame; cut them out, and dress the place with aquafortis. There is another fault which blacksmiths are guilty of, and which is a great hurt to a horse, that is, cutting or paring the heel down

too much. The heel being best to come at, they clap the paring-knife there and cut them down, when there is no need to take any off them at all. The heels are the greatest support of the horse, and, by paring them too thin, both corns and lameness in the back sinews are produced.

Before a blacksmith begins to shoe a valuable horse, especially a road-horse, he should examine how he stands and how he goes. If he go low, heavy shoes should be used; but if he go high, light ones. If he turn his toes out, he will cut with the heel, and, if he turn them in, will cut with the spurn. If he have a thin, flat foot, he should have broad shoes; but, if a hollow, dished foot, narrow ones. If the crust be thin, and the vein near, small nails should be used. Some horses are hoof-bound—that is, have straight heels, which pinch the vein between the hoof and the coffin. When this is the case, thin the soles of the feet till the blood springs through, and then put on screw-shoes, and screw the feet out. Let the screw-shoes stay on a fortnight. You may screw the feet out more than half an inch.

The next thing to be considered is gravel rising from the bottom to the top of the foot, and breaking out at the cornet. How many twitter-bones have been thus formed that might have been prevented! When the gravel comes up to the top of the foot, take away the sole at the bottom, and the hoof at the top, and mix equal parts of oil of turpentine and oil of origanum, and bathe the top part of the foot. This will prevent a twitter from forming.

A Twitter-Bone.—A twitter-bone makes a horse very lame, and not fit for work. It keeps throwing a tough white matter out of what is called a pipe. In order to cure it, first find out where the pipe leads. This you may do with a piece of round lead, the size of a small quill-barrel. Have the following ready, viz.:

½ ounce of sublimate, in fine powder.
1 ounce of spirits of salt.

Mix all together, and syringe a squirt full into the pipe when you take the lead out; and, when you draw out the point of the syringe, put your thumb on the place to prevent it coming back again, and then put on a pledget of green salve and tow. Do this every other day, for three or four times, and by this method most twitters may be removed. But, if this fails, the next thing to be done is to put a hot iron, the thickness of a small finger, where the pipe leads to, and to fill the hole with sublimate, and bind on it a pledget of green salve with a cloth. Let it be five days, and then lay on some more salve and tow, and in five days more the twitter-bone and pipe will come out. The wound must be washed with the following mixture, and

dressed with green salve and tow every other day, till nearly well:

1 ounce of bole.
1 ounce of oil of origanum.
4 ounces of oil of turpentine.

Shake them up well together, and they will both help to heal the wound and bring down the substance. If any more twitter-bones or pipes form, you must take them out in the same manner.

A Fistula, and Bruises of the Withers.—The withers are much subject to bruises, caused by bad saddles, or such as are too wide in the front; but, whatever be the cause, it is well known that by neglect they often terminate in a fistula.

When the withers are bruised, and a swelling appears, lay a poultice of bran and vinegar over the part. People who have a horse which is crushed in the withers, and pay no regard to it, are worse than savages, and are not fit to have such a useful animal.

Cure.—After a horse has been bruised in the withers, the skin breaks, and matter is discharged, and then the owner supposes that the abscess will subside, but he is often mistaken; and the pipe which he perceives throwing out matter is, at the same time, running forwards in the withers, and forming a fistula. When you find the disease proceeding in this manner, lay the pipe open, and dress it with the following mixture

4 ounces of potash.
4 ounces of honey.
2 ounces of white vitriol.
1 pint of vinegar.

Boil all together, wash the wound well with the mixture, and lay on the green salve and tow. If the above be not dry enough, add two ounces more of white vitriol, and two ounces of bole. These will make a salve by themselves; and by these methods you may cure any disease of the withers arising from external injuries.

But tumors often arise in the withers from internal causes, such as the crisis of fevers. When this happens, you must not attempt to stop it, nor use anything to put it back, for by this means you would drive it more into the shoulder-blades, and make it worse to cure; but, on the contrary, do everything you can to assist nature in bringing it forward. You cannot do better than lay on poultices twice a day till it breaks, for reason tells us that it is better to do so than to cut it; but, when it is broken, open the orifice with a knife, that you may have more freedom in using it; but be careful in using the knife, that you do not catch hold of the ligament which turns along the neck of the withers. Sometimes it runs to the other

side of the neck under the withers. The cure is the same as before. Lay all the cavities open with the knife, and not cut across if you can avoid it. Then take the following never-failing mixture to dress with:

4 ounces of crude sal ammoniac.
2 ounces of bole.
8 ounces of honey.
2 ounces of pearl ashes.
2 ounces of white vitriol.
1 pint of vinegar.

Boil all together, and apply it to the wound every day at first, and afterwards every other day till well.

Warbles, Girth-Galls, and Plushes from Saddles.—These grievances are commonly known, and the following mixture will effect a cure, take off the soreness, and leave the skin kind. I may affirm that it is one of the best recipes yet found out for the purpose:

2 ounces of extract of lead.
½ an ounce of white copperas.
2 ounces of spirits of wine.
4 ounces of soft water.
1 ounce of spirits of sal ammoniac.

Mix all together in a bottle, keep shaking it up, and rub the affected places well with it, and put your saddles and barfens on while the places are wet, in order to prevent them from infecting other horses.

Sometimes horses have what are called setfasts on their backs. Rub them with a little mercurial ointment, in order to raise them and make them come off; and, if you cannot pull them out after using the ointment, cut them out with a sharp knife, and apply to the place the above mixture, or heal it up as a common wound. Most excrescences on horses are cured in this manner.

Windgalls.—These are mostly on the hind legs, near the fetlock, but I have known them above the fetlock, and on the arm. Windgalls are not only eye-sores, but lame many a horse. Many methods are used to disperse them without effect. If you put your finger on one side, and your thumb on the other, and press with one of them, you will find the windgall to go quite through the leg. The reason that they are mostly on the hind leg is, that the horse stands lower behind than before, and throws most weight on the hind legs.

CURE.—On the first appearance of a windgall, bathe the place well with warm vinegar and spirits of wine, and put a pretty tight bandage round it. If this do not remove it, lay on blistering ointment till the cure shall be completed. But should this method also fail, which it seldom does, you must lay the windgall open and dress it as a common wound. Before you

use the knife, be careful to get the horse's body into a proper cool state by physic.

The Grease.—This disorder is mostly brought on by soft corn, hard usage, want of proper cleaning, or a depraved state of the blood and juices; therefore, it is proper to divide it into two heads.

CURE, WHEN THE VESSELS ARE RELAXED.—On first observing the legs of a horse to swell after standing several hours, and to recover their proper dimensions with exercise, be careful to wash them clean with chamber-ley, soap-suds, or vinegar and water, every time he comes in, for this will prevent or remove the disorder. Horses that have round or fleshy legs are more subject to the grease than those that have flat legs; but a flat-legged horse is more easily sprained. Nitre, sulphur, and liver of antimony are proper, both to prevent the grease and refine the blood. Mix equal parts of each, and give a meat-spoonful every day in his food.

CURE FOR THE GREASE FROM INTERNAL CAUSES.—If the horse be full of flesh, the cure must be begun by bleeding, rowels, and repeated purging; after which two ounces of the following balls should be given every other day for some time, and they will work by urine the day following:

4 ounces of yellow resin.
2 ounces of salt of prunel.
1 ounce of oil of juniper.
2 ounces of salt of tartar.
8 ounces of Castile soap.
1 ounce of camphor.

Put these into a mortar with about two ounces of honey, or as much as will make them into balls, and they will carry off the offending humors, and free the blood from its noxious qualities. But, at the same time these internal remedies are taken, outward ones should not be omitted. The legs should be bathed with warm verjuice; and, if very bad, a poultice of boiled turnips applied. If turnips cannot be got, make a poultice of linseed meal and bran, with a little hog's lard in to prevent it from growing hard.

Sometimes horses are neglected when in the grease till they have what are called grape-legs. These may be cured on their first appearance, when they are in bud, by laying on caustic, or corrosive sublimate. When the swelling is abated, make the following into a salve to dress the sores with:

1 ounce of blue stone vitriol, in powder.
2 ounces of white lead, in powder.
4 ounces of honey.

Mix these well together, and lay them on the sores with tow, to heal them; but should they continue foul, and not frame to heal, mix four ounces of green salve, and four ounces

of Ægyptiacum ointment well together, and lay it on in the above manner. The mixture will both heal and dry up the sores.

Scratches.—This disease is a forerunner of the grease, and is a hot, oozing matter that breaks out like links, with a nauseous smell. It is very troublesome to a horse, causing his heels to look red and angry, and to be very sore; and, sometimes, it is so violent as to render a horse lame, and make him unfit for use.

If you do not bleed and physic as soon as you find a heat in a horse's heels, you may soon have him laid in the grease. Sometimes in slight touches of this complaint the heels are not hotter than usual. In that case, take a little flour of sulphur and spirits of wine, mix them together into an ointment, and fill the cracks well with it. When the disorder is too hot to be healed by this ointment, rub with a little Ægyptiacum ointment, but be careful not to lay too much on, for it is a great drier.

Rat-tails at first resemble the grease, and are attended with a hot, scorbutic humor at the beginning, and often by neglect destroy the roots of the hair, and then there is no complete cure for them, but they may be relieved by rubbing with equal parts of strong mercurial ointment and Flanders oil of bays.

If the horse have got the scurvy, or scabs on his legs, this ointment will mostly take them off; but if not, mix well with hog's lard, one drachm of sublimate, in fine powder. These two last mixtures will cure most scabs, and mixed together will cure the itch.

The Crown Scab.—This disorder is similar to the last. It breaks out on the cornet of the foot, and is at first a hot, running tumor, and, afterwards, a dry, scurvy scab. Let the horse be bled, and physicked, and then rub him with either of the above ointments, and the cure will be effected.

How to Manage a Horse on a Journey.—In the first place, find out whether the horse is in health, and has been properly fed and exercised; for, when a horse is flushed up, and has had no exercise, he is very unfit for a journey. Before you set out be careful to observe if his shoes are fast, and if they sit easy; also, whether he cuts before or behind, or interferes, as it is called. If a horse cut with bad shoes he will probably do it with new ones, notwithstanding what horse dealers may say to the contrary.

If your horse's back inflame by the rubbing of the saddle, wash the part, as soon as you perceive it, with salt and water, or vinegar and water, and have the stuffing of the saddle altered, so as to remove the pressure from the part effected.

but if the skin be broken before you perceive it, the injured part should be washed with a mixture, composed of equal parts of extract of lead, spirits of wine and water. You must look well after his back, and walk sometimes, in order to ease him, especially when going down hill.

It often happens, especially to young horses, that the legs swell, or become gourdy, as farriers call it, with traveling, and more frequently when a horse cuts. It is also observed that the hind legs swell oftener than the fore legs, because the fore parts stand highest in the stall, and, consequently, the greatest stress lies on the hind legs. The best method of prevention is to wash the legs with warm water every time you bait, by which means the disease will be prevented, and much time, trouble and expense saved.

Nothing is of more consequence in traveling than to take care that your horse has water at proper times and in proper quantities. When a horse travels he perspires considerably, especially in hot weather, and should, therefore, be allowed to drink a little more than usual, as opportunity offers, which will refresh him greatly; but never suffer him to drink much at a time, for, if you suffer him to drink his fill, he will be dull and sluggish afterwards, besides the harm he may receive from drinking too much cold water when he is hot. Never allow your horse to be led in water, or to have his heels washed, after you have arrived at your inn, but let him have lukewarm water, or water moderately cool, when he has stood some time in the stable.

It is a general rule that when any extraneous body, or foreign matter, such as sand or gravel, is lodged in any part of the animal's body, it must be extracted as soon, and as easily, as possible. When gravelly matter has got into the quick at a nail-hole, or any other aperture, it ought to be removed as soon as possible, but with as little loss of substance as the nature of the case will admit of, for it is a folly to cut and pare away the hoof, as some ignorant farriers do; because by that means they increase the evil, instead of removing it, as it is a considerable time before the breach is repaired, and, till that is done, the same part is likely to admit more gravel. So much, therefore, and no more, of the hoof should be taken away as is necessary, viz.: till the blackness or discoloration vanishes; then the wound should be dressed with the following balsam:

½ an ounce of balsam of Peru.
6 drachms of myrrh.
3 drachms of storax.
3 drachms of Socotrine aloes.
3 drachms of frankincense.
3 drachms of gum guaiacum.

Powder the ingredients that will powder, and put them in a bottle with one quart of spirits of wine, and let them stand

warm for eight or ten days, shaking the bottle up every day. This is an excellent balsam for green wounds, and no person that keeps valuable horses should be without it. Apply it warm to the wound, dipping a piece of tow or lint into it, and fastening it on to the part out of which the gravel or thorn has been taken, and renew it as it grows dry.

A horse is often seized with the gripes on a journey, the best and surest cure for which is the following :

9 drachms of tincture of opium.
1 ounce of spirits of sweet nitre.
2 ounces of olive oil.

Mix the above in half a pint of mint-water, give it to the horse, and, at the same time, bed him well, that he may lie down to rest, and be careful not to give him cold water for a day or two after.

A horse that is subject to scouring or purging on the road, has what is called a washy constitution, and such horses seldom bear hardships well, because the aliment passes off before it is thoroughly digested, which is a sign that the fibers of the stomach and bowels are lax ; therefore, such horses should not be chosen. The best method of curing the disorder is to keep the horse chiefly on hard food, and to give him proper exercise.

When a horse purges upon the road, occasioned by foul feeding, or catching cold, give him the following :

4 ounces of Venice treacle.
3 ounces of Armenian bole.
1 ounce of Japan earth.
1 ounce of powdered ginger.

Make these up into four balls, and give them night and morning.

When a horse has got a cough by catching cold, give

4 ounces of cordial balls.
1 ounce of licorice powder.
1 ounce of elecampane bark.

Give all together in warm ale, fasting, and to fast two hours after.

Hints on Feeding.—The foundation of many diseases is laid in feeding all horses in the same proportions, without regard to age, constitution, or the work which the horse is required to do. The impropriety of such a course is readily seen.

Bad hay has not proper nourishment in it ; therefore it would be poor policy to buy it simply because it is cheap, as it is often very dear in the end.

Old horses will do better on chaff than on hay, as they can chew and digest it better.

There is not sufficient nutriment in hay or grass alone to support a horse well under hard work.

Corn which has been damaged is very injurious, as it will produce inflammation of the bowels and skin diseases.

Oats and corn are the best nourishment if a horse is worked hard, but if not, it should be chiefly hay, because corn and oats supply more nourishment and flesh-making material than any other kind of food ; but hay not so much.

For a coach horse, four to six quarts of good oats, and eighteen pounds of good hay, are usually sufficient. If a horse should be worked hard he should have more of each ; but, if worked but little, he should have less.

Chopped hay, sprinkled with a little water, which has a teaspoonful of salt dissolved in it, is quite pleasing to the taste of the horse, and is also more easily digested.

Spring or well water is not usually as good for a horse as water from a stream or pond, as the former is usually hard and cold.

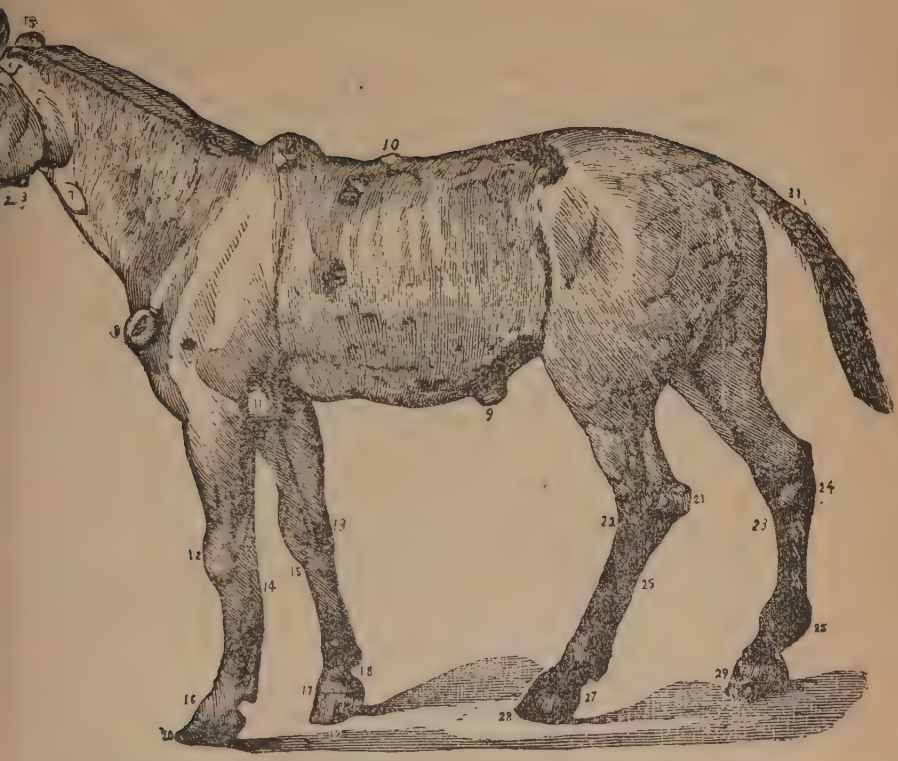
Horses require and should have at least a pailful of water, morning or evening; or, what is better, give a half pailful at four different times in a day.

A horse should not be driven or worked hard directly after he has had a full draught of water, nor soon after eating heartily, as exertion prevents digestion.

Do not allow a horse to become accustomed to drinking warm water, for, if compelled to drink cold at any time, it will be liable to cause colic.

Do not work nor drive a horse if he refuses his food, after drinking, until you have given him rest.

Do not feed nor water a horse directly after his coming in very warm, but let him walk about until cool; groom him quite dry first with a wisp of straw, and then with a comb and brush, and rub the legs well with the hand. When he is cool give him his grain.



1. Caries of the lower jaw.
2. Fistula of the parotid duct.
3. Bony excrescence or Exostosis of the lower jaw.
4. Swelling by pressure of the bridle.
5. Poll-evil.
6. Inflamed parotid gland.
7. Inflamed jugular vein.
8. Fungus tumor, produced by pressure of the collar.
9. Fistula in the withers.
10. Saddle-gall.
11. Tumor of the elbow.
12. Induration of the knee.
13. Clap of the back sinews
14. Malanders.
15. Splint.
16. Ring-bone.
17. A Tread upon the coronet.
18. Quittor.
19. Sandcrack.
20. Contracted or ring foot of a foundered horse.
21. Capped hock.
22. Malanders.
23. Spavin.
24. Curb.
25. Swelled sinews.
26. Thick leg.
27. Grease.
28. A crack in front of the foot, called cow-crack
29. Quarter-crack.
30. Ventral hernia.
31. Rat-tail.

A FEW MISCELLANEOUS RECIPES

Cough.—Quit feeding musty hay, and feed roots and laxative food. Sprinkle human urine on his fodder, or cut up cedar boughs, and mix with his grain, or boil a small quantity of flax-seed, and mix it in a mash of scalded bran, adding a few ounces of sugar, molasses, or honey. Administer lukewarm. If there should be any appearance of heaves, put a spoonful of ground ginger once per day in his provender, and allow him to drink freely of lime water.

Split or Broken Hoof.—Let the blacksmith bore two holes, on each side of the crack or split, pass along nails through the holes, and clinch tight. After anointing with the hoof-bound liquid, it will soon grow together.

To Cure Distemper.—Take 1 1-4 gals. blood from the neck vein; then administer sassafras oil, 1 1-2 ounces. Cure speedy and certain.

Founder Cured in 24 Hours.—Boil or steam stout oat-straw for half an hour; then wrap it around the horse's leg quite hot; cover up with wet woolen rags, to keep in the steam; in 6 hours renew the application; take one gal. of blood from the neck vein, and give one quart of linseed oil. He may be worked next day.

Cure for Staggers.—Give a mess twice a week, composed of bran, 1 gal.; sulphur, 1 tablespoonful; saltpetre, 1 spoonful; boiling sassafras tea, 1 quart; assafœdita, 1 1-8 ounce. Keep the horse from cold water for half a day afterwards.

Cure for Bots.—Give the horse first, 2 quarts of new milk and 1 quart molasses; fifteen minutes afterwards, give 2 quarts very strong sage tea; 30 minutes after the tea, give 3 pints (or enough to operate as physic) of currier's oil. The molasses and milk cause the bots to let go their hold, the tea puckers them up, and the oil carries them completely away. Cure certain in the worst cases.

Ring-Bone and Spavin Cure.—Venice turpentine and Spanish flies, of each two ounces; euphorbium and aqua-ammonia, of each 1 ounce; red precipitate, 1-2 ounce; corrosive sublimate, 1-4 ounce; lard, 1 1-2 lbs. Pulverize all, and put into the lard; simmer slowly over coals, not scorching or burning; and pour off free of sediment. For ring-bones, cut off the hair, and rub the ointment well into the lumps, once in forty-eight hours. For spavins, once in twenty-four hours for three mornings. Wash well previous to each application with suds, rubbing over the place with a smooth stick to squeeze out a yellow matter. This has removed very large ring-bones.

Bone Spavins, French Paste.—Corrosive sublimate, quicksilver, and iodine, of each 1 ounce. Rub the quicksilver and iodine together, then add the sublimate, and lastly the lard, rubbing them thoroughly. Shave of the hair the size of the bone enlargement; grease all around it, but not where the hair is shaved off; this prevents the action of the medicine, except on the spavin; then rub in as much of the paste as will lie on a three-cent piece, each morning, for three or four mornings. In from seven to eight days, the whole spavin will come out; then wash the wound with suds for an hour or so, to re-

move the poisonous effects of the paste; afterwards heal up the sore with any good healing salve, keeping the sore covered while it is healing up.

ANOTHER RECIPE FOR RING-BONE.—Pulverize cantharides, oils of spike, origanum, amber, cedar, Barbadoes tar and British oil, of each 2 ounces; oil of worm wood, 1 ounce; spirits turpentine, 4 ounces; common potash, 1-2 ounce; nitric acid, 6 ounces; sulphuric acid, 4 ounces; lard 3 lbs. Melt the lard, and slowly add the acids; stir well, and add the other articles, stirring till cold; clip off the hair, and apply by rubbing and heating in. In about three days, or when it is done running, wash off with soap-suds, and apply again. In old cases, it may take three or four weeks; but, in recent cases, two or three applications have cured.

ANOTHER.—Pulverized cantharides, oils of origanum and amber and spirits turpentine, of each 1 ounce; olive oil, 1-2 ounce; sulphuric acid, 3 drachms; put all except the acid into alcohol, stir the mixture, add the acid slowly, and continue to stir till the mixture ceases to smoke; then bottle for use; apply to ring-bone or spavin, with a sponge, tied on the end of a stick, as long as it is absorbed into the parts; twenty-four hours after, grease well with lard, and, in twenty-four hours more, wash off well with soap-suds. One application is generally sufficient for spavins, but may need two; ring-bones always two or three applications, three or four days apart, which prevents loss of hair. This will stop all lameness, but does not remove the lump.

SPLINT AND SPAVIN LINIMENT.—Oil of origanum, 6 ounces; gum camphor, 2 ounces; mercurial ointment, 2 ounces; iodine ointment, 1 ounce; melt by putting all into a wide-mouthed bottle, and setting it in a kettle of hot water. Apply it to bone-spavins, or splints, twice daily for four or five days, and a cure is guaranteed.

Liniment for Sweeney.—Alcohol and spirits turpentine, of each, 8 ounces; camphor-gum, pulverized cantharides, and capsicum, of each, 1 ounce; oil of spike, 3 ounces; mix. Bathe this liniment in with a hot iron, and a certain cure is sure to follow.

For Looseness or Scouring in Horses or Cattle.—Tormentil root powdered; dose for a horse or cow, 1 to 1 1-2 ounce. It may be stirred into 1 pint of milk, and given; or, it may be steeped in 1 1-2 pints of milk, then given from three to six times daily until cured.

Scours and Pin-Worms in Horses and Cattle.—White-ash bark burnt into ashes, and made into a rather strong lye; then

mix 1-2 pint of it with 1 pint warm water, and give all two or three times daily. This will certainly carry off the worms, which are the cause, in most instances, of scours and looseness.

Grease Heel.—Lye made from wood ashes, and boil white-oak bark in it till it is quite strong, both in lye and bark-ooze; when it is cold it is fit for use. Wash off the horse's legs with Castile soap; when dry, apply the above lye with a swab fastened on a long stick to keep out of his reach, as the smart caused by the application might make him let fly without much warning; but it is a sure cure, only it brings off the hair. To restore the hair after the cure is effected, make and apply a salve by stewing elder bark in old bacon; then form the salve by adding a little resin according to the amount of oil when stewed, or 1-4 lb. resin to each pound of oil.

2. Chloride of zinc, 1 1-2 drachms; water, 10 ounces; glycerine, 8 ounces; mix. If there is much discharge, apply a poultice for several hours, followed by application of the above, after cleansing well with soft water and Castile soap. The following powders should be given at the same time in the feed, every night for a week or two: Bicarbonate of soda, 1 ounce; arsenic, 1 drachm; iodide of iron, 1-2 ounce; fenugreek, 2 ounces; ginger, 2 ounces; elecampane, 1 ounce. Mix thoroughly, and divide into 12 powders.

For Scratches and Grease Heel.—1. Balsam fir, 4 ounces; lard, 4 ounces. Stir, with a gentle heat, until thoroughly mixed. Wash the sores well with Castile soap and apply.

2. Sugar of lead, 2 ounces; borax, 1 ounce; sweet oil, 6 ounces. Mix, and apply twice daily, after washing with Castile soap, and drying.

3. Tincture of myrrh, 2 ounces; glycerine, 4 ounces; tincture of arnica, 2 ounces. Mix thoroughly, and apply two or three times a day, after cleansing, as above, with Castile soap.

4. Take 1-2 ounce of powdered verdigris and 1 pint of rum, or proof spirits. Mix, and apply once or twice a day. This works nicely for grease heel or mud fever.

5. Take oxide of zinc, 1 drachm; lard, 1 ounce; powdered gum benzoin, 10 grains; camphorated spirits, 1 drachm. Mix thoroughly, and rub on twice a week. Do not wash after the first application.

To Distinguish and Cure Distemper.—Wet up bran with rather strong lye; if not too strong, the horse will eat it greedily; if they have the distemper, a free discharge from the nostrils, and a consequent cure, will be the result if continued a few days; but, if only a cold, with swellings of the glands, no change will be discovered.

Physic Balls for Horses.—Barbadoes aloes, from 4 to 5 or 6 drachms (according to the size and strength of the horse); tartrate of potassa, 1 drachm; ginger and Castile soap, each 2 drachms; oil of anise or peppermint, 20 drops. Pulverize and make all into one ball with thick gum solution. Feed by giving scalded bran instead of oats for two days before giving the physic, and during its operation.

Nerve and Bone Liniment.—Take beef's gall, 1 qt.; alcohol, 1 pt.; volatile liniment, 1 lb.; spirits of turpentine, 1 lb.; oil of origanum, 4 ounces; aqua ammonia, 4 ounces; tincture of Spanish flies, 6 ounces; mixed. Uses too well known to need description.

This is more particularly applicable to horse flesh.

Condition Powders.—Take fenugreek, cream of tartar, gentian, sulphur, saltpetre, resin, black antimony and ginger, equal quantities of each, say 1 ounce, all to be finely pulverized; cayenne, also fine, half the quantity of any one of the others, say 1-2 ounce. Mix thoroughly. It is used in yellow water, hidebound, coughs, colds, distemper, and all other diseases where condition powders are generally administered.

In ordinary cases, give two teaspoonsfuls once a day in feed. In extreme cases, give it twice daily.

Cathartic Condition Powders.—Gamboge, alum, saltpetre, resin, copperas, ginger, aloes, gum-myrrh, salts, and salt, and, if the horse is in very low condition, put in wormwood, all the same quantities, viz.: 1 ounce each. Dose, 1 tablespoonful in bran, twice daily; not giving any other grain for a few days; then once a day, with oats and other good feed.

This last is more applicable for old, worn-down horses which need cleaning out, and starting again into new life, and in such cases, just the thing to be desired.

Condition Powders—1. Gentian, fenugreek, sulphur, saltpetre, cream of tartar, of each, 2 ounces; resin, black antimony, of each, 1 ounce; ginger, licorice, 3 ounces each; cayenne, 1 ounce, pulverized and mixed thoroughly. Dose, 1 tablespoonful, once or twice a day, mixed with the feed. Used with good success for coughs, colds, distemper, hidebound, and nearly all diseases for which condition powders are given.

2. Fenugreek, 4 ounces; ginger, 6 ounces; anise, pulverized, 4 ounces; gentian, 2 ounces; black antimony, 2 ounces; hard-wood ashes, 4 ounces. Mix all together. Excellent to give a horse an appetite.

3. Licorice, 4 ounces; fenugreek, 4 ounces; elecampane, 4 ounces; blood root, 1 ounce; tartar emetic, 1-2 ounce; ginger and cayenne, each, 1 ounce. Mix, and give a tablespoonful two or three times a day in feed. One of the best condition

powders for any cough, cold, distemper, or epizootic; also excellent for heaves. For heaves, 1 ounce of lobelia and camphor may be added.

For Heaves.—1. One teaspoonful of lobelia given in the feed, once a day, for a week, and then once or twice a week, will stop them for a time.

2. Balsam copabia, 1 ounce; spirits of turpentine, 2 ounces; balsam fir, 1 ounce; cider vinegar, 16 ounces. Mix and give a tablespoonful once a day.

3. Saltpetre, 1 ounce; indigo, 1-2 ounce; rain-water, 4 pints. Mix, and give a pint twice a day.

4. Licorice, elecampane, wild turnip, fenugreek, skunk-cabbage, lobelia, cayenne, and ginger; equal parts of each. Mix, and give a tablespoonful once or twice a day. If the horse refuse to eat it in feed, make it into a ball and give.

5. Calcined magnesia, balsam of fir, balsam copabia, of each, 1 ounce; spirits of turpentine, 2 ounces. Put them all into 1 pint of best cider vinegar. Give for a dose, 1 tablespoonful in his feed once a day for a week, then every other day for two or three months. Wet his hay with brine, and also his other feed. He will cough more at first, but looser and looser till cured.

Contracted Hoof or Sore Feet.—1. Take equal parts of soft fat, yellow wax, linseed oil, Venice turpentine, and Norway tar; first melt the wax, then add the others, mixing thoroughly. Apply to the edge of the hair once a day.

2. Benzine, 1 ounce; salts of nitre, 1 ounce; alcohol, 3 ounces; aqua ammonia, 2 ounces; Venice turpentine, 8 ounces. Mix, apply to the edge of the hair, and all over the hoof, once a day, for ten days, then twice a week for a short time

Horse Liniments.—1. Oil spike, oil origanum, oil hemlock, oil wormwood, aqua ammonia, camphor gum, of each, 2 ounces; olive oil, 4 ounces; alcohol, 1 quart. Mix. This is an excellent liniment for man or beast.

2. Oil origanum, oil amber, sweet oil, of each 1 ounce; oil spike, aqua ammonia, and oil of turpentine, of each, 2 ounces. Mix.

3. Linseed oil, 8 ounces; turpentine, 8 ounces; oil origanum, 4 ounces. Mix well. This is excellent for sprains and bruises, and is good as a general liniment.

4. Oil spike, 1 ounce; oil origanum, 2 ounces; alcohol, 16 ounces. Good for lameness resulting from almost any cause.

5. Take equal parts of alcohol, chloroform, aqua ammonia, Jamaica rum and water, and mix

6. Turpentine and seneca oils, of each, 7 1-3 ounces; sweet oil and tincture of arnica, of each, 3 2-3 ounces; oils of

origanum, hemlock, juniper, amber, and laudanum, of each, 1 1-3 ounces; spirits of ammonia, 1-2 ounce; and gum camphor, 1-4 ounce, which make a little less than 1 quart, there being 64 quarts, besides the gum camphor, in the whole amount. This calculation will be sufficiently near for all practical purposes.

LINIMENT, VERY STRONG.—Oil of spike, aqua ammonia, and oil of turpentine, each 2 ounces; sweet oil and oil of amber, each 1 1-2 ounces; oil of origanum, 1 ounce. Mix.

LINIMENT FOR FIFTY CENTS PER GALLON.—Best vinegar, 2 quarts; pulverized saltpetre, 1-2 lb.; mix and set in a cool place till dissolved. Invaluable for old swellings, sprains, bruises, &c.

Cuts, Wounds and Sores.—1. Take of lard, 4 ounces; beeswax, 4 ounces; resin, 2 ounces; carbolic acid, 1-4 ounce. Mix the three first and melt, then add the carbolic acid, stirring until cool. This is excellent for man, as well as beast.

2. Tincture aloes, 1 ounce; tincture myrrh, 1-2 ounce; tincture opium, 1-2 ounce; water, 4 ounces; mix, and apply night and morning.

3. Tincture opium, 2 ounces; tannin, 1-4 ounce. Mix.

4. Carbolic acid, 1 ounce; soft water, 1 quart. Mix.

Ointment for Horses.—Beeswax, 2 ounces; resin, 3 ounces; lard, 4 ounces; carbolic acid, 1 drachm; honey, 1-2 ounce; melt all together, and bring slowly to a boil, then remove from the fire, and add slowly, 1 gill of spirits of turpentine, stirring all the time until cool; used with good success for galls, cracked heels, flesh wounds or bruises

Eye Water.—Sugar of lead, 1 drachm; tincture of opium, 2 drachms; soft water, 1 pint; mix, and wash the eye two or three times a day.

Founder.—1. Vinegar, 3 pints; cayenne pepper, 1-2 drachm; tincture of aconite root, 15 drops; mix, and boil down to 1 quart; when cool, give it as a dreneh; blanket the horse well; after the horse has perspired for an hour or more, give one quart of raw linseed oil; this treatment will be found good for horses foundered by eating too much grain.

2. Some recommend for horses foundered on grain, to bleed about 1 gallon, then to drench the horse with 1 quart of raw linseed oil; after this to rub the fore legs well, and for a long time, with very warm water, having a little tincture of opium mixed with it. As the horse will not recover from loss of blood for a long time, it is usually better to adopt the treatment given in No. 1.

Tonic Balls.—Copperas, 1 1-2 drachms; ginger, 1 drachm; gentian, 1 drachm; saltpetre, 3 drachms, resin, 1-2 ounce; flaxseed meal, 1 ounce; mix, and form into a ball.

CORDIAL BALLS—1. Anise, powdered, 1-2 ounce; ginger, 1 drachm; gentian, 1 drachm; fenugreek, 2 drachms. Mix.

2. Caraway and ginger, each, 2 drachms; anise, gentian and fenugreek, each, 1 ounce. Mix.

3. Camphor, 1 drachm; anise, 3 drachms; tincture of opium, 1 ounce; powdered extract of licorice, 3 drachms, flaxseed meal, 1 ounce. Mix.

LAXATIVE BALLS.—1. Linseed meal, 1 ounce; aloes, 1-2 ounce; Castile soap, 1-2 ounce. Mix.

2. Ginger, 1 drcahm; Castile soap, 2 drachms; Barbadoes aloes, pulverized, 6 drachms; flaxseed meal, 1 ounce.

Cough Mixtures.—1. Oil of tar, given as directed for treatment of heaves, is one of the best remedies for nearly all coughs.

2. Take of alcohol, 1-2 pint; balsam of fir, 2 ounces; mix well, and add all the tar it will cut. Shake well before using. Dose from one to two spoonfuls, two or three times a day.

Thrush.—1. Wash the feet well with Castile soap and water, and sprinkle a small quantity of pulverized blue vitriol in the cleft, and then fill up all the cavities with cotton, and press it in, so as to keep out all dirt, and repeat as often as necessary until the cure is complete.

2. Blue vitriol and copperas, of each one ounce, burnt alum, 2 ounces; white vitriol, 1-4 ounce. Mix.

3. Take white vitriol, 2 ounces; soft water, 8 ounces. Mix, and apply to the diseased surface, after the ragged parts have been cut away and thoroughly cleansed. Pack the cavities with cotton batting, so as to keep out all dirt.

Healing Mixtures.—1. Carbolic acid, 1 ounce; soft water, 2 pints. Mix.

2. White vitriol, 1 ounce; soft water, 2 pints. Mix.

3. Pulverized camphor, 1 drachm; prepared chalk, 6 drachms: burnt alum, 4 drachms. Mix. Sprinkle over the sore.

4. Tincture of opium, 1 ounce; tannin, 1 drachm; mix and shake well before using. Excellent for galls of collar, saddle, or in fact for any purpose requiring a healing astringent.

FOR FRESH WOUNDS.—Copperas, 2 drachms; white vitriol, 3 drachms; gun powder, 2 drachms; boiling soft water, 2 quarts. Mix; when cool it is ready for use.

SORE LIPS.—The lips become sore frequently at the angles

of the mouth, from bruising with the bit. They can be cured by applying the following mixture:

Tincture of myrrh, 2 ounces; tincture of aloes, 1 ounce, and tincture of opium, 1-2 ounce. Mix, and apply three or four times a day.

For Flesh Wounds.—To prevent inflammation or tendency to sloughing or mortification, take 1 pound saltpetre; 2 gallons of water; 3 pints proof spirits. Mix, and inject into the wound with a syringe, three times a day until it heals. In treating deep wounds, or those of a dangerous character, especially if the animal is inclined to be fat, give a dose of physic, feed bran, carrots, &c. No grain should be fed, and grass is more desirable than hay. If grass is fed freely, physic is not necessary.

Quarter Crack.—The best way to cure quarter crack is to open the heel on that side, between bar and frog, cutting down pretty well, (not sufficient to cause bleeding), until the quarter will give freely; then put on a shoe that will expand the heel. It is also necessary in this case that the inner heel should be opened or spread, as the hoof is simply too small for the foot; if this is properly done the point is directly reached. Some recommend, in addition to this, burning with a hot iron a crease across at the upper edge of the hoof. If this is done properly the hoof will not split any more. The hoof may now be more rapidly grown if desired. Opening the foot and the shoe is the point of success.

Cracked Heels.—Tar, 8 ounces; beeswax, 1 ounce; resin, 1 ounce; alum, 1 ounce; tallow, 1 ounce; sulphate of iron, 1 ounce; carbolic acid, 1 drachm; mix, and boil over a slow fire. Skim off the filth, and add 2 ounces of the scraping of sweet elder.

Cure for Mange.—Oil of tar, 1 ounce; lac sulphur, 1 1-2 ounces; whale oil, 2 ounces. Mix. Rub a little on the skin wherever the disease appears, and continue, daily, for a week, and then wash off with Castile soap and warm water.

For Sprains, &c.—Hog's lard and spirits of turpentine. Mix, and place in the hot sunshine for four or five days. Apply four or five times a week.

For Colic.—Take of gum myrrh, 1 ounce; gum camphor, 1 ounce; powdered gum guaiac, 1 ounce; cayenne, 1 ounce; sassafras bark powdered, 1 ounce; spirits turpentine, 1 ounce; oil origanum, 1-4 ounce; oil hemlock, 1-2 ounce; pulverized opium, 1-2 ounce; strongest alcohol, 2 quarts; mix all together and shake often for eight or ten days and filter or strain

through flannel. Dose, from 1 to 3 tablespoonfuls, according to the severity of the case; give in a pint of milk.

We have never known the above remedy to fail of giving relief when given for colic, in horses. In many cases where it has been used it has given immediate relief even though various other remedies had failed of giving any relief.

It makes one of the very best of pain killers for family use, and we advise all to keep it on hand.

To Grow Hair.—Mix sweet oil, 1 pint; sulphur, 3 ounces. Shake well, and rub well into the dock twice a week.

For Worms.—Calomel, 1 drachm; tartar emetic, 1-2 drachm; linseed meal, 1 ounce; fenugreek, 1 ounce. Mix and give in feed at night, and repeat the dose for two or three times, and follow with 1 1-2 pints of raw linseed oil, about 6 hours after the last powder has been given.

For Distemper.—Hops, 2 ounces; carbolic acid, 30 drops; boiling water, 2 gallons. Mix the hops and carbolic acid with the boiling water and compel the animal to inhale the steam for 15 or 20 minutes at a time, and repeat three times a day. Apply a strong mustard paste to the throat, and place a warm poultice over the paste. Feed warm mashes and boiled vegetables; keep the stable comfortably warm, and the air pure. Give the following powders once a day: Powdered Peruvian bark, 2 ounces; powdered gentian, 1 ounce; powdered copperas, 1 ounce; mix, and divide into 8 powders.

How to Make a Horse Follow You.—Turn him out into a large stable or shed, where there is no chance to get out, with a halter or bridle on. Go to him and gentle him a little; take hold of the halter and turn him towards you, at the same time touching him lightly over the hips with a long whip. Lead him the length of the stable, rubbing him on the neck, saying, in a steady tone of voice, as you lead him, "Come along, my boy!" or, use his name instead of "my boy," if you choose. Every time you turn, touch him slightly with the whip, to make him step close up to you, and then caress him with your hand. He will soon learn to hurry up to escape the whip, and be caressed, and you can make him follow you around without taking hold of the halter. If he should stop and turn from you, give him a few sharp cuts about the hind legs, and he will soon turn his head towards you, when you must always caress him. A few lessons of this kind will make him run after you, when he sees the motion of the whip—in twenty or thirty minutes he will follow you around the stable. After you have given him two or three lessons in the stable, take him in a small lot and train him; and from thence you can take him into the road, and make him follow you anywhere, and run after you.

To Make a Horse Stand Without Holding.—After you have well broken him to follow you, stand him in the center of the stable, begin at the head to caress him, and gradually work backwards. If he moves, give him a cut with the whip, and put him back to the same spot from where he started. If he stands, caress him as before, and continue gentling him in this way until you can get around him without making him move. Keep walking round him, increasing your pace, and only touch him occasionally. Enlarge your circle as you walk around, and if he then moves, give him another cut with the whip, and put him back to his place. If he stands, go to him frequently and caress him, and then walk round him again. Do not keep him in one position too long at a time, but make him come to you occasionally, and follow you around the stable. Then stand him in another place, and proceed as before. You should not train him more than half an hour at a time.

To Prevent a Horse From Scaring.—This process is very simple. Whenever a horse scares at objects on going along the road, always stop him, and let him face the object. Lead him slowly towards it, and let him touch it with his nose. Take the pains to do this on every occasion, and it will soon break him entirely. If your horse is frightened at an umbrella, you can soon teach him to be used to that. Go into the stable with him, and first let him look at the umbrella before it is opened —let him touch it with his nose. Open it a little way, and then let him see it, and, finally, open it wide. By ordinary patience you can soon teach the horse to have the umbrella opened suddenly in his face, without his being afraid of it. By a similar treatment you can break any horse from scaring at almost anything that may look frightful to him. If you wish to make a trial of this theory, just take a horse into the stable, and let him examine the frightful object a few minutes, after his mode of examining things, and you will be perfectly satisfied. There is a singular fact connected with taming the horse that I would have never believed if I had not tried it. If you accustom him to any particular object by showing it to him on one side only, he will not be afraid when he sees it with the eye on that side, but he will be afraid if you approach him with it on the other side. It is, therefore, necessary to pacify him on both sides in all cases. After you have accustomed him to the umbrella, or whatever you may wish to make him familiar with, on his right side, repeat the operation on the left side in the same manner as if you had not approached him at all.

Blinds or Blinkers.—All my experience with and observation of horses, proves clearly to me that blinkers should never be used, and that the sight of the horse, for many reasons, should not be interfered with in any way. Horses are only

fearful of objects which they do not understand, or are not familiar with, and the eye is one of the principal mediums by which this understanding and this familiarity are brought about. The horse, on account of his very amiable nature, can be made, in the course of time, to bear almost anything in any shape; but there is a quicker process of reaching his intelligence than that of wearing it into him through his skin and bones. However wild and nervous a horse may be, he can be taught in a very short time to understand and not to fear an object, however frightful in appearance. Horses can be broken in less time, and better, without blinkers; but horses that have always worn them will notice the sudden change, and must be treated carefully the first drive. After that they will drive better without the blinkers than with. I have proved by my own experiments, that a horse broken without blinkers can be driven past any omnibus, cab or carriage, on a parallel line as close as it is possible for him to go, without ever wavering or showing any disposition to dodge. I have not, in the last eight or ten years, constantly handling horses, both wild and nervous, ever put blinkers on any of them, and in no case have they ever shied at passing objects.

The horse's eye is the life and beauty of the animal, as well as the index of all his emotions. It tells the driver, in the most impressive characters, what the horse's feelings are. By it he can tell the first approach of fear in time to meet any difficulty; he can tell if he is happy or sad, hungry or weary. The horse, too, when permitted to see, uses his eyes with great judgment. He sees better than we do. He can measure distances with eyes better than we can, and, if allowed free use of them, would often save himself, by the quickness of his sight, from collisions, when the driver would fail to do so by a timely pull of the reins. It would also save many accidents to pedestrians in the streets, as no horse will run on to any person that he can see. Blinkers are rapidly going out of use in the United States, and I have yet to find the man who, having once left them off, could ever be persuaded to put them on again. They are an unnecessary and injurious incumbrance to the horse, and in years hence will be a thing to be read of as one of the follies happily reformed in the nineteenth century.

Rules for Purchasing a Horse.—When you are looking to purchase a horse, first examine the eyes well. The best judges are sometimes deceived in the eyes, therefore, you cannot be too careful. Clearness of the eyes is a sure indication of their goodness; but this is not all that should be attended to; the eye-lids, eyebrows, and all the other parts, must also be considered; for many horses, whose eyes appear clear and brilliant, go blind at seven or eight years old. Therefore, be careful to

observe whether the parts between the eyelids and the eyebrows are free from bunches, and whether the parts round the under eyelids be full, or swelled; for these are indications that the eyes will not last. When the eyes are remarkably flat, or sunk within their orbits, it is a bad sign; also, when they look dead and lifeless. The iris, or circle that surrounds the sight of the eye, should be distinct, and of a pale, variegated, cinnamon color, for this is always a sure sign of a good eye, and it adds beauty to the appearance of the animal.

In the next place, examine the teeth, as you would not wish to purchase an old horse, nor a very young one for service.

The feet should next be regarded; for a horse with bad feet is like a house with a weak foundation, and will do little service. The feet should be smooth and tough, of a middle size, without wrinkles, and neither too hard and brittle, nor too soft; the heels should be firm, and not spongy and rotten; the frogs horny and dry; the soles somewhat hollow, like the inside of a dish or a bowl. Such feet will never disappoint your expectations, and such only should be chosen.

Particular regard should be paid to the shoulders; they should not be too much loaded, for a horse with heavy shoulders can never move well; and, on the other hand, one that has very thin shoulders, and a narrow chest, though he may move briskly so long as he is sound, yet he is generally weak, and easily lamed in the shoulders; a medium should therefore be chosen.

The body, or carcass, should be neither too small nor too large. The back should be straight, or have only a moderate sinking below the withers; for when the back of a horse is low, or higher behind than before, it is both very ugly and a sign of weakness. The back should also be a proper length. The ribs should be large, the flanks smooth and full, and the hind parts, or uppermost haunches, not higher than the shoulders. When the horse trots before you, observe if his haunches cover his fore-knees. A horse with short hind-quarters does not look well.

The next thing to be regarded in a horse is his wind, which may be easily judged by the motion of his flanks. A broken-winded horse also pinches in his flanks, with a slow motion, and drops them suddenly, which may be easily perceived. Many horses breathe thick that are not broken-winded; indeed, any horse will in foggy weather, or if foul fed, without sufficient exercise; but, if a horse has been in good keeping, and had proper exercise, and yet had these symptoms, there is some defect, either natural or accidental, such as a narrow chest, or some cold that has affected the lungs.

There are other particulars that should be observed in

choosing a horse. If his head be large and fleshy, and his neck thick and gross, he will always go heavy on the hand. and, therefore, such should never be chosen. A horse that has his hocks very wide, seldom moves well, and one that has them too near, will chafe and cut his legs by crossing them. Fleshy-legged horses are generally subject to the grease, and other infirmities of that kind, and, therefore, should not be chosen.

The temper of a horse should be particularly attended to. Avoid a fearful horse, which you may know at first sight by his starting, crouching, or creeping, if you approach him. A hot and fretful horse is also to be avoided, but the buyer should be careful to distinguish between a hot, fretful horse, and one that is eager and craving. The former begins to fret the moment he is out of the stable, and continues in that humor till he has quite fatigued himself; and the latter only endeavors to be foremost in the field, and is truly valuable; he has those qualities that resemble prudence and courage; the other those of intemperate heat and rashness.

A horse that goes with his fore feet very low, is apt to stumble; and there are some that go so near the ground that they stumble most on even roads; and the dealers, to remedy this, put heavy shoes on their feet; for, the heavier a horse's shoes are, the higher he lifts his feet. Care also should be taken that the horse does not cut one leg with the other. A horse that goes near the ground will cut the low side of the fetlock joint, but one that goes high cuts below the knee, which is called the speedy cut. A horse that lifts his feet high generally trots fast, but is not the easiest for the rider. Some horses cut with the spurn of the foot, and some with the heel; but this you may soon perceive by their standing; for, if a horse points the front of his foot inward, he cuts with the spurn, and if outward, with the heel.

These few instructions may be of use in purchasing horses; but I advise every one to get some experimental knowledge of them before he trusts to his judgment, for the dealers have so many arts to hide the defects of their horses, that the best judges are often deceived.

SOUND OR UNSOUND, ACCORDING TO LAW.

The definition of unsoundness is, "the existence of disease or alteration of structure, which does or will impair the horse's natural usefulness." Vice also may be defined, on a similar principle, as "the prevalence of a habit which interferes with the horse's natural usefulness." But these definitions must be taken with some modifications, for there is not one horse in a hundred which does not possess some disease or vice likely to impair his general usefulness to some slight extent; indeed,

the proportion of strictly sound horses may be considered to be much smaller even than this. A bad feeder is generally so from a disordered state of stomach, and such a horse cannot stand work like one which will consume double the quantity of corn, yet he would not be considered unsound; nor would a horse be returnable as vicious if he showed the usual symptoms of being "fresh," though they might impair his usefulness in carrying a timid rider. But, subject to such modifications, the above definitions may be accepted as sufficient to make intelligible the terms, "unsoundness" and "vice."

The following diseases and accidents are generally considered not to render their possessors unsound:

Bog-Spavin, in a slight degree only.

A Broken Knee, unless the joint is injured so as to impair its functions, is not considered to be unsoundness.

Capped Hocks and Elbows do not produce any lameness, nor do they in any way interfere with the action of the joints to which they are adjacent.

Contraction of the foot is no evidence of disease, and, taken by itself, is not sufficient to prove it to be unsound.

Crib-biting was decided, in the case of Broennenbury vs. Haycock and Scolefield vs. Robb, not to be unsoundness; but Baron Parker ruled in the latter that it came within the meaning of the word "vice." Undoubtedly this is a habit which is generally attended by impaired digestion, and, as such, it comes strictly within the definition given above, but the law is as I have stated it.

Curby hocks, though experience may tell us they are likely to be attended by curbs, are decided not to be unsoundness. In Brown vs. Elkington, the attention of the vendor was directed to the hocks by the purchaser before the sale, as likely to spring curbs; but in the action on the warranty it was held by Lord Abinger that a "defect in the formation of the horse, which had not occasioned lameness at the time of sale, though it might render the animal more liable to be lame at some future time, was no breach of warranty;" and the Court of Exchequer confirmed this view of the law, by refusing a rule for a new trial.

Cutting, on the same principle, is no breach of warranty, unless the horse is lame from it at the time of sale.

A splint is not, in itself, evidence of unsoundness; but if it is so situated as necessarily to interfere with the suspensory ligament or tendons, or if it is has already produced lameness, it is to be accepted as a mark of unsoundness.

Thoroughpin, when existing to a moderate extent, is not sufficient to render the horse unsound; but this will always be a question of opinion, and a horse with a thoroughpin is, therefore not to be warranted with safety.

THRUSH, occurring from mismanagement only, and not from any defect in the horse, is clearly not to be considered as unsoundness.

SORENESS of the joints from work, as it soon goes off after a short rest, is not accepted as unsoundness.

WINDGALLS are also only evidence of work, and do not usually cause lameness. When this co-exists, it is sufficient to produce unsoundness, without resorting to the windgalls.

The following list comprises the diseases and injuries which have been settled as sufficient to entitle the purchaser to return a horse warranted sound:

BOG-SPAVIN, when it is so severe as clearly to interfere with the action of the joint; and blood-spavin, as making an aggravated form of the same disease.

BREAKING DOWN, even though the horse is restored so as to run without lameness.

BROKEN WIND.

CATARACT, in any degree.

CORNS, unless very trifling; but they should be discovered within a few days of the sale, or it may be alleged that they have been produced by subsequent mismanagement.

COUGH, as long as it lasts. A horse with chronic cough is clearly returnable.

CURBS constitute unsoundness; but they must be shown to exist at the time of purchase, for a horse may throw out one immediately after he is transferred to the purchaser.

DISEASES of the organic kind in any of the internal viscera.

FARCY.

FOUNDER, OR LAMINITIS, whether it produce lameness or not, if it manifestly has existed, is to be accepted as unsoundness; for when there is evidence of its previous occurrence, the laminæ are injured so much as inevitably to lead to lameness when the horse is put to work.

GREASE, AND GLANDERS.

MANGE.

MEGRAMS, when the attack comes on subsequently to the sale, and can be shown to have occured before it.

A NERVED HORSE is unsound from the existence of the disease for which the operation has been performed, as well as from the division of the nerves.

OPHTHALMIA, if it can be proved to have previously existed, and comes on soon after the purchase, is to be received as unsoundness. So, also, when any of the evidences of its previous presence can be detected, and are proved by a veterinary surgeon, the horse is returnable.

OSSIFICATION of any of the structures adjacent to the

joints is unsoundness, and hence ossification of the lateral cartilages will be considered so, without doubt.

PUMICED FOOT, as evidence of laminitis.

QUIDDING.

QUITOR.

RINGBONES AND SIDEBONES, whether large or small, are undoubtedly sufficient to constitute a horse unsound.

ROARING, WHISLING, &c., as evidence of contraction of the rima glottidis, and therefore interfering with respiration.

RUPTURES of all kinds.

SPAVIN (bone), although it may not have occasioned lameness, if it is clearly the disease so named.

STRINGHALT has been decided to be unsoundness. (Thompson vs. Patterson).

THICK WIND, as marking some impediment to respiration.

THRUSH, when it is in one of the severe forms, and not caused by mismanagement.

THICKENING OF THE BACK SINEWS, or suspensory ligament, when existing to any extent easily appreciable, is to be received as a proof of unsoundness.

Returnable vices are comprehended in the following list:

BITING, when carried to any unusual extent.

BOLTING or running away.

CRIB-BITING.

KICKING, when more than usual.

RESTIVENESS, or refusal to proceed in the desired direction.

REARING.

SHYING, when marked.

WEAVING in the stable.

When a horse is purchased with the conditions that he is warranted sound, or free from vice, or quiet to ride and drive, the warranty must either be in writing, or given in the presence of a disinterested third person. The form of warranty is as follows, and it is better that it should be on the same paper as the stamped receipt, though this is not absolutely necessary if it is shown that the receipt is properly given:

Date.

Received of A. B. C. $2 50 *for a bay gelding, by Smallhopes, warranted five years old, sound, free from vice, and quiet to ride and drive.*

$250. *X. Y. Z.*

Any one or more of these points may be omitted, or the horse may simply be warranted "a good hack," in which case he must fairly answer that description. The terms "has been hunted," or "has carried a lady," are not to be trusted, as it is only necessary to prove in defence that the horse has seen hounds, and had a woman on his back.

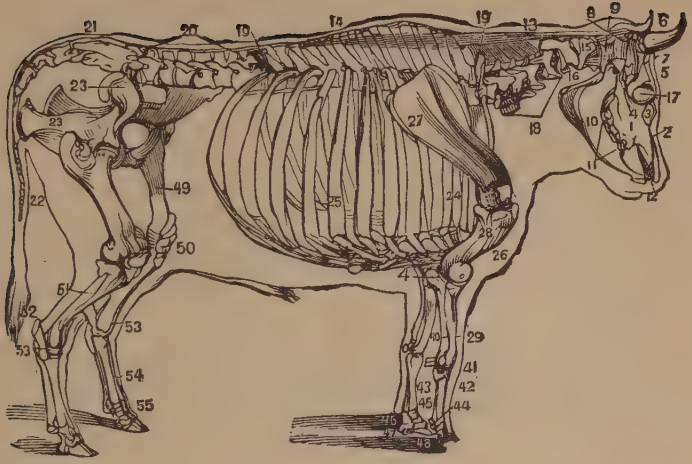
Whether the horse under examination is to be warranted or not, the intended purchaser should never omit to look over every point where unsoundness is likely to occur. To do this effectually, it should be done regularly, by which there is less chance of passing over any serious defect. The usual mode of proceeding is as follows: Under no circumstances, if it can possibly be avoided, should he be looked at immediately after having been out of doors, and, if he is of necessity brought to the purchaser, let him be put in the stable and quietly rested for one or two hours at least, by which time the effects of most of the "coping" tricks will have gone off.

Before the horse passes the stable door, stop him with his head just inside, and in that position carefully examine his eyes. The light is exactly suited to this, and the sensibility of the iris may well be judged of. Any specks or opacities are also here readily seen. Then let him be led to a level surface, and then proceed to look over every part, beginning with that nearest the one already inspected, namely, the mouth. Then "cough" him by tightly grasping the larynx, by which some idea may be formed of the state of his respiratory organs, after which the usual manuœuvre with the stick may be practised if there is no opportunity of examining into his freedom from rearing in the saddle. When these points are satisfactorily disposed of, look to the position of the fore legs, that is, whether they are turned in or out, and, if the latter, feel the elbows, and see if they are confined or "tied," that is, too close to the ribs, also look for marks of cutting or speedy cutting. Pass the hand down the back sinews and suspensory ligaments, examine the knees for any marks, and then carefully feel the coronets and heels for any marks of oxostosis or ossification. Lastly, take a good look at the front of the foot, and, then lifting it, inspect the frog, heels and sole. This will complete the front half of the body, after which the form of the middle and loins should be regarded, and then, lifting the tail, the openness, or otherwise, of the space around the anus, will give some idea of the strength of constitution, while the resistance afforded by the dock will be a sign of the muscular strength of the back. Then look carefully at the hocks, examine the spavin and curb places, and finish the whole by passing the hand down the hind cannon bones to the fetlocks, and feel them in the same order as in the fore legs. Now let the horse rest a minute, if his groom will let him, with his head quite at liberty, and you will be able to judge of his ordinary habit of standing, when unexcited. At the conclusion of this careful examination, while at rest, the action must be minutely investigated, by first having the horse walked with a loose rein, and then trotted in the same way slowly, when, if he is sound, he will put his feet down

regularly and firmly. Grooms, when they want to conceal defects, will not let the head be loose, nor will they trot slowly, but bustle the horse along, with their hands as close as possible to the mouth, so as to prevent any nodding of the head as much as they can. A very good judge will be perhaps able to select a pleasant pack or harness horse by seeing him thus run, and afterwards ridden, but a far better test is to ride or drive him yourself, when his freedom from vice, or disease, may be ascertained, as well as his manners, and the ease of his various paces. No trouble should be spared to get this real trial, which is worth ten per cent. on the purchase money, for many a horse that looks to go well, does not feel so, and it is well worth that sum, to be saved the trouble attending upon the possession of a horse which does not suit. When, however, after such a careful examination by a competent judge, and subsequent trial in the saddle or in harness, the horse is found to be really likely to answer all the purposes for which he is wanted, a few dollars should never prevent his being obtained.

"VICTORIA," A TYPICAL DAIRY SHORTHORN.

CATTLE.



1 The upper jaw-bone. 2. The nasal bone, or bone of the nose. 3. The lachrymal bone. 4. The malar, or cheek bone. 5. The frontal bone, or bone of the forehead. 6. The horns, being processes or continuations of the frontal. 7. The temporal bone. 8. The parietal bone, low in the temporal fossa. 9. The occipital bone, deeply depressed below the crest or ridge of the head. 10. The lower jaw. 11. The grinders. 12. The nippers, found on the lower jaw alone. 13. The ligament of the neck, and its attachments. 14. The atlas. 16. The dentata. 17. The orbits of the eye. 18. The vertebræ, or bones of the neck. 19. The bones of the back. 20. The bones of the loins. 21. The sacrum. 22. The bones of the tail. 23. The haunch and pelvis. 24. The eight true ribs. 25. The false ribs, with their cartilages. 26. The sternum. 27. The scapula, or shoulder-blade. 28. The humerus, or lower bone of the shoulder. 29. The radius, or principal bone of the arm. 40. The ulna, its upper part forming the elbow. 41. The small bones of the knee. 42. The large metacarpal or shank bone. 43. The smaller or splint bone. 44. The sessamoid bones. 45. The bifurcation at the pasterns, and the two larger pasterns to each foot. 46. The two smaller pasterns to each foot. 47. The two coffin bones to each foot. 48. The navicular bones. 49. The thigh bone. 50. The patella, or bone of the knee. 51. The tibia, or proper leg bone. 52. The point of the hock. 53. The small bones of the hock. 54 The metatarsals, or larger bones of the hind leg. 55. The pasterns and feet.

Next to the horse, the cow is justly valued as the most useful animal which man has been able to domesticate and retain permanently in his service. The ox tribe, of which it is the female, belongs to the order Ruminantia, in the class Mammalia; these terms implying that the animals ruminate or chew their food a second time, and have mammæ or teats with which they suckle their young. In the ox tribe there are different genera and species, all more or less differing from each other.

The wild breed, from being untamable, can only be kept within walls or good fences; consequently very few of them are now to be met with, except in the parks of some English gentlemen, who keep them for ornament and as a curiosity. Their color is invariably of a creamy white; muzzle black; the whole of the inside of the ear, and about one-third of the outside from the tip downward, red; horn white, with black tips very fine, and bent upward; some of the bulls have a thin upright mane about four or five inches long. The weight of the oxen is from 450 to 550 lbs. and the cows from 280 to 450 lbs. The beef is finely marbled and of excellent flavor.

The domesticated species of oxen is, in all its varieties, materially altered from its wild parentage. Influenced by climate, peculiar feeding, and training in a state of subjection, its bony structure is diminished in bulk and power, its ferocity tamed, and its tractability greatly improved. Our observations will refer chiefly to the cow, on which very great changes have been effected by domestication; the most remarkable of these alterations has been in the capacity for giving milk. In a wild state, the udder is small, and sinks into an insignificant compass when the duty of suckling is over; but when domesticated for the sake of its milk, and that liquid is drawn copiously from it by artificial means, the lacteal, or milk-secreting vessels enlarge, and the udder expands so as to become a prominent feature in the animal. In this manner, by constant exercise, the economy of the cultivated species of cows has been permanently altered, and rendered suitable to the demands which are constantly made on it. Yet it is important to remark that those milk-yielding powers are not equal in the different varieties or breeds of cows. Some breeds, from the influence of circumstances, give a large quantity of milk, but of

a thin or poor quality, while others yield less milk, but of a good or rich quality. Whether, then, the cow-keeper wish quantity or quality, is the question for him to solve in making a selection of stock. In general, near large towns, where the demand for milk is considerable, the object of dairymen is to keep cows which will give a large quantity of milk, no matter of what sort. Private families in the country are usually regardful of the quality of the article; they wish a little milk which is good, some fine cream, and perhaps, also, some sweet butter and cheese; and on that account are more careful in their choice of their cows.

Breeds of Cattle.—The breeds of cattle vary in different districts, from the small hardy varieties of the north Highlands, to the bulky and handsome breeds of the southern parts of England. It has been customary to classify the whole according to the comparative length of the horns—as the long-horned, short-horned, middle-horned, crumpled-horned, and hornless or polled breeds. Besides these, there are many intermixed breeds. The middle-horned cows, which are found in the north of Devon, the east of Sussex, Herefordshire, and Gloucestershire, in England, are among the most valuable and beautiful varieties of the animal.

Whatever be the breed, there are certain conformations which are indispensable to the thriving, valuable ox or cow. If there is one part of the frame, the form of which, more than of any other, renders the animal valuable, it is the chest. There must be room enough for the heart to beat and the lungs to play, or sufficient blood for the purposes of nutriment and strength will not be circulated; nor will it thoroughly undergo that vital change which is essential to the proper discharge of every function. We look, therefore, first of all, to the wide and deep girth about the heart and lungs. We must have both; the proportion in which the one or the other may preponderate will depend on the service we require from the animal; we can excuse a slight degree of flatness on the sides, for he will be lighter in the forehand, and more active; but the grazier must have width as well as depth. And not only about the heart and lungs, but over the whole of the ribs, must we have both length and roundness; the hooped as well as the

deep barrel is essential; there must be room for the capacious paunch—room for the material from which the blood is to be provided. The beast should also be ribbed home; there should be little space between the ribs and the hips. This seems to be indispensable in the ox, as it regards a good healthy constitution and a propensity to fatten; but, a largness and drooping of the belly, notwithstanding that the symmetry of the animal is not improved, are considered advantageous in the cow, because room is thus left for the udder; and if these qualities are accompanied by swelling milk veins, her value in the dairy is generally increased. This roundness and depth of the barrel, however, are most advantageous in proportion as found behind the point of the elbow, more than between the shoulder and legs; or low down between the legs, rather than upward toward the withers; for, the heaviness before, and the comparative bulk of the coarser parts of the animal, are thus diminished, which is always a very great consideration. The loins should be wide. Of this there can be no doubt, for they are the prime parts; they should seem to extend far along the back; and, although the belly should not hang down, the flanks should be round and deep. Of the lips, it is superfluous to say that, without being ragged, they should be large, round, rather than wide, and presenting, when handled, plenty of muscle and fat. The thighs should be full and long, close together when viewed from behind, and the farther down they continue close, the better. The legs may occasionally vary in length, according to the destination of the animal; but, shortness is a good general rule, for there is an almost inseparable connection between length of leg and lightness of carcass, and shortness of leg and propensity to fatten. The bones of the legs (and they are taken as a sample of the bony structure of the frame generally) should be small, but not too small—small enough for the well-known accompaniment, a propensity to fatten—small enough to please the consumer; but not so small as to indicate delicacy of constitution and liability to disease. Lastly, the hide—the most important thing of all—should be thin, but not so thin as to indicate that the animal can endure no hardship; movable, mellow, but not too loose, and particularly well covered with fine and soft hair.

Of the various breeds and cross-breeds of cows now in use, there are a few which enjoy the best reputation.

Native Cattle.—This is a favorite term with Americans, and comprehends everything in the country, excepting such as are of a pure and distinct breed. It embraces some of the best, some of the worst, and some of almost every variety, shape, color and character of the bovine race. The designation has no farther meaning than that they are indigenous to the soil, and do not belong to any well defined or distinct variety. The best native cattle of the Union are undoubtedly to be found in the north-eastern States. Most of the early emigrant cattle in that section were from the southern part of England, and, though not bearing a close resemblance to any particular English breed, unless it has been impressed upon them by more recent importations, yet a large number have that general approximation in character, features and color, which entitles them to claim a kindred with one or another of the better breeds there. They have been so promiscuously interbred that most of their original characteristics are lost, and an amalgamation of their good, bad or indifferent qualities have become diffused into their present condition

Of the native cattle we need not further speak; they abound everywhere, and their various qualities are well known; but, as they evidently need improvement by an infusion of better, and foreign distinct breeds among them, the principal varieties of those introduced here for that purpose will be named.

The Devons.—This beautiful race is claimed, in England, their native country, where only in Europe they are bred in any considerable numbers, to be aboriginal in blood, being known there before the time of the Roman invasion, in the early centuries of the Christian era. They are of medium size, red in color, symmetrical in shape, and of great beauty in appearance, combining almost every good quality demanded in the bovine race. They have been kept and cultivated for many centuries in the south-western counties of England—more in Devonshire than elsewhere—and much improved in form and early ripeness within the last century. They were brought into America probably among the early importations of cattle by the Massachusetts colonies. We have no accounts

of their having been distinctly bred by themselves, and they became soon lost in the miscellaneous admixtures which prevailed among all the early importations. Yet their blood and characteristics were strong, and they gave tone and style to many of the predominating herds in various sections of the country, where their taking appearance made them favorites as working oxen.

They are fine in the bone, round and long in the carcass, wide in the hips, short in the leg, straight and broad in the back, fine in the head and neck, deep in the chest and brisket, prominent in the eye, high and spreading in the horn, and yellow in the muzzle—taken altogether, of most graceful and blood-like appearance. They are naturally excellent milkers, giving a medium quantity, and of remarkably good quality, yielding the richest butter. It is but just to say, however, that the English breeders of them, within the last century, have bred them more with a view to flesh and early maturity as beef cattle than for the dairy, in which symmetry in form, early ripeness, and choicer meat has been obtained at the expense of their dairy qualities. Yet among the thorough-bred herds in the United States, where attention has been paid to the milk development, they have proved well in that particular.

A few small herds of pure Devons were imported into the United States early in the present century. Those have since been added to by several new importations into several of the eastern States, down to a quite recent date, and been bred in their purity, and of a quality quite equal, probably, to their original ancestry in England. Their beef is of the best quality, and for working oxen they excel almost any others, being quick and sprightly in action, docile in temper, easily matched in color and movement. Yet with all their good qualities, they have not, of late, been so generally sought and appreciated as their merits demand, as tastes and fashions change, in cattle, as in some other commodities. But, for hilly and medium soils, no cattle are better fitted, as a profitable stock, for the farmer. We decidedly recommend them, from long experience in their keeping, as a valuable and profitable race.

The Herefords.—This is another valuable breed, of great antiquity in some of the western counties of England, border-

ing on Wales, of which Herefordshire is the chief, and from which the cattle take their name. They have been bred there, time immemorial, with a distinctive character altogether their own, and are claimed, by their breeders and advocates, to have an origin as distinct and pure as any other breed. In England they are highly esteemed as among the best of the beef producing breeds, in early maturity, and a profitable carcass, and hold a sharp competition and rivalry with even the best of other breeds for the shambles. As working oxen they are unsurpassed. As a dairy cow, the Hereford is less esteemed, not running to milk so well as the Devons, and some of the other more common dairy breeds.

They were probably early imported, with other cattle, to America, but, like them, became lost in the general diffusion of their blood with them. Their size is large, their color red, with white or mottled faces, sometimes white backs and bellies, and occasionally a deep roan of red and white intermixed on their bodies. In general shape they are much like the Devons, a fourth larger in size, somewhat coarser in the bone, and hardly so refined and graceful in the outline. Their horns are high and spreading. So far as tried in America, as a beef animal they mature early, as at three to four years they are well grown for fattening. As a working ox, no beast can be better, being large, strong, readily matched, docile, and of great strength—taken altogether, the best of working cattle.

Several herds of pure Herefords have been imported here within thirty years past; successfully bred, and scattered. They have been well approved, as a grazier's beast, fitted to our medium soils, and profitable. Several good herds now exist among us, but, we regret to say, they are not sought by our leading cattle breeders with the avidity to which, by their actual merits, they are entitled.

The Ayrshires.—This is, perhaps, the most popular breed of milch cows now in Scotland, taking their name from the county of Ayr, where they were first originated and bred, and obtained their celebrity. Their origin is of recent date, being within the last hundred years, and made up from the original Scotch Kyloe cow, by a cross of bulls obtained from the north-eastern counties of England, mainly, so far as our investiga-

tions have proved, the Shorthorns, the older original families of which were known as excellent milkers. The history of these various crosses is too much involved in obscurity to trace it thoroughly within our limited pages; but, as they are now, a well established breed of great merit in their lacteal qualities, and widely disseminated in Scotland, England and America as dairy cattle, their history is of less consequence than the fact of their decided excellence for the pail. They may now be considered as an established dairy breed, capable of perpetuating, in their own blood alone, their excellent qualities. As such, they are now bred, cherished and valued.

In size they are medium, compared with our native cattle; in color, dark red, or brown and white, occasionally inclining to roan, sometimes flecked or spotted, the red and white variously intermingling. Their shape is usually good, being squarely built, short in the leg, broader behind than before, as all good milkers should be, straight in the back, wide across the hips, finely shaped udder, with the milk marks well developed, and bounteous milkers. Their heads are small, the horns short and well set, the eye bright, the nose either dark or yellow, but the dark usually prevailing,—altogether a satisfactory dairy cow.

They were first imported into America in the year 1822, and many more about 1830, when they readily established a good reputation as milkers. Frequent importations, and in considerable numbers, have since been made, and they have been bred and multiplied with a care evincing the value accorded to them by those who best knew their good properties. They are fitted to our medium soils and rougher lands, being active in movement, docile in temper, and grazing where some of the heavier and more sluggish breeds would not so well flourish.

As a beef or laboring animal, they have been but little sought or tried. That the quality of their flesh may be good—equal, perhaps, to others—we have no reason to doubt, although our opportunities to judge them have been limited. As a laboring ox they have really had no trial. Their demand, hitherto, for breeding purposes, has been too active to admit of thorough trials for either flesh or labor.

The Polled Cattle, or Galloways—Of Scotland, have been recently introduced into Upper Canada (now Ontario) by

several of the Scotch farmers there. They are a beef animal chiefly, the cows having little reputation in their native land as milkers. They are of medium size only, mostly black in color, although occasionally red, dun, or black and red brindled, compact in shape, and hornless. They are hardy, easy keepers, early matured, and of excellent quality for flesh. They thrive well on rough soils and in a severe climate, and may, on some of our leaner lands, yet obtain a considerable celebrity. Some of their partial breeders and advocates contend that they are good milkers, but such is not their usual reputation. For the lighter labor uses they have proved good working oxen.

The Short-horns.—This is the most universally popular foreign breed in our country. Their large size, full development, and excellent general qualities, have made them universal favorites on all good soils where abundant grasses prevail. They have great size, great length, breadth, and depth of carcass, small in bone, fine in symmetery, attractive in color, which is red and white, wholly, or of those colors in patches, or agreeably intermingling through all degrees and shades of roan. They are fine in the head, clean in the neck, with yellow noses, bright eyes, small, short, curved horns, and of elegant, imposing contour. They mature early, at three to four years old, and make a quick and profitable return of their food in either milk, or beef, for either of which purposes they may be profitably bred and used, as selections are made, or these qualities are required. As working oxen exclusively, we do not recommend them, as they are heavier and slower in movement than some of the other breeds, or even our native cattle.

They are of ancient origin, and until early in the present century never known, to any extent, only in a few of the north-eastern counties of England. In their present improved condition they were imported to America, only so late as the earlier years of the present century. But since their good qualities have become more known and approved, frequent and valuable importations have been made of the best blood, and they have been bred and scattered throughout the country, with an assiduity pertaining to no other foreign breed and promising a popularity among our cattle breeders and farmers, on the richer soils, which is likely to become permanent.

When bred for that purpose, they have proved excellent milkers, and for quantity of flesh to the carcass they are superior as a beef producing animal. Yet, in their pure blood, and kept solely for breeding, they require good care to keep them up to their best condition, in quality and appearance, as, indeed, do all other good cattle, of any established breeds.

The Alderneys, or Jerseys—Are a choice, small race, giving a moderate quantity of very rich, creamy milk, much prized by families who choose to indulge in the rarest luxury of its kind. They are natives of the Channel Islands of Britain, lying off the coast of Normandy, in France, where they are reared and kept in the highest perfection. In size they are small, and in shape lean, ragged, and angular, as compared with the Devons or Short-horns. Their heads are small, yet symmetrical, with black muzzles, mealy faces, bright, prominent eyes, dishing or slightly concave forehead, light, short, crooked horns, and thin necks. Their shoulders are high and narrow; they are thin in the chest, large in the belly, somewhat depressed in the back, high and well spread in the hips, thin in the thighs. The udder and teats are well shaped and delicate, giving a moderate quantity—say eight to twelve quarts a day—of the richest, yellowest milk, and yielding more butter to a given quantity than any other race of cows known. Their colors are usually fawn and white, or "squirrel grey," prettily blended, and sometimes a smoky, or deep brown hue, and occasionally black and white mottled. They have a peculiarly blood-like appearance, and of distinct characteristics from any other breed. They are docile in disposition, not so hardy to withstand the severe vicissitudes of our climate as some others, yet great favorites with those who properly appreciate and carefully use them. They are rapidly increasing in popularity, particularly in the neighborhood of our large towns and cities. Indeed, some of our tasteful lovers of this race of bovines, jocularly assert that the ownership of one or more Alderneys is necessary to constitute a finished "country gentleman.'

As a beef producing, or working ox, the Alderney is in little request, their forms not being fitted to excel in the one, nor their muscular form sufficient for the strength of the other.

Still they are a most useful and desirable breed for the purposes to which they are applied.

Points of Cattle.—In adverting briefly to the properties of cattle, it will be advisable to describe the points by which they are characterized:

1. The nose or muzzle, in the Devon, Hereford, and Sussex, the muzzle is preferred when of a clear golden color. When brown or dark, it is an indication that this breed has been crossed with some of the Welsh or other breeds.
2. The forehead should neither be narrow nor very broad—the eye prominent, The nostril between the eye and muzzle should be thin, which is particularly the case in the best breeds of Devon cattle.
3. The horns should be thin, projecting horizontally from the head, and turning up at the tips, as in the breeds of the Devon, Sussex, and Hereford.
4. The neck should be neither long nor short, full at the sides, and not too deep in the throat, coming out from the shoulders nearly level with the chin, with a thin dewlap.
5. The top of the plate bones should not be too wide, but rising upon a level with the chine, and well thrown back, so that there may be no hollowness behind; this point gives facility to the walk. From the point of the shoulder to the top of the plate bones should be rather full outside, to admit the ribs to bow.
6. The shoulder point should lay flat with the ribs without any projection. When the shoulder point projects outward, the beast seldom fattens well about the shoulder vein.
7. The breast should be wide and open, projecting forward.
8. The chine should lie straight, and well covered with flesh.
9. The loin should be flat and wide, the side lying parallel, and nearly as high as the chine—almost as wide at the fore as at the hinder part; being an indication of the ribs bowing out, which is desirable.
10. The hip or huckle bones should be wide apart, coming upon a level with the chine, to the first touch or setting on of the tail.
11. The first touch or tip of the rump should be tolerably wide, so that the tail drop in a level between the two points. The tail should come out broad as an indication of a flat chine.
12. The thigh should not be too full outside or behind, which is always an indication of bully flesh, but the inside or twist should be full.
13. The hock or hough should be flat and rather thin, not coarse and gummy, which indicates coarseness in the animal.
14. The hind leg should be flat and thin. The legs of a medium length, and the hock or hough rather turning out.
15. The feet or claws not too broad.
16. The flank should be full and heavy when the animal is fat, indicative of being fat inside.
17. The belly should not drop below the breast, but in a horizontal line with it.
18. The shoulder should be rather flat, not projecting.
19. The foreleg should also be flat and upright, but not fleshy.
20. The round or pot-bone should not project, but lie flat with the outside of the thigh.
21. The under jaw. The jaws should be rather wide, particularly for beasts intended for working, as it affords them greater liberty to breathe.
22. The chap should be fine, indicating a disposition to feed.
23. The ribs should spring nearly horizontally from the chine, the sides round, forming a circle; in which case the animal will never drop in the belly, and will lay its meat on the prime parts. The great objection to the Sussex breed of cattle is that they are too sharp in the chine, and the ribs too flat. When this is the case, the animal will always drop in the belly, and seldom lay its meat on the prime joints.

Remarks on Breeds.—We have thus briefly treated of some of the many breeds of cattle considered valuable as dairy stock in Britain; but we pretend not to give any decided opinion as to which is best. The merits of each kind have been vigorously contested by their respective advocates, and it would be extremely difficult to decide between them. Upon the form and qualifications of a perfect cow, it ought to be observed, that whatever breed is selected, there is a wide difference between

the form of one meant for fattening and that intended for the dairy. The first should resemble the ox as nearly as possible; while the latter should be long and thin on the head, with a brisk, quiet eye, lank in the neck, narrow across the shoulders, but broad at the haunches; and there should be no tendency to become fat. The udder should be large and full looking, but not protruding too far behind; the teats all pointing out and downward, equal in size and rather long and tapering; all corresponding with the signs or escutcheons. A cow with a high back-bone, large head, small udder, and showing an inclination to become fat, will be found to be a bad milker. This description applies to all breeds; and, of course, the difference between a cow for fattening and one for yielding milk will be comparative.

The following are the most important qualities of the dairy cow: Tameness and docility of temper greatly enhance its value. One that is quiet and contented feeds at ease, does not break over fences, or hurt herself or other cattle, will always yield more milk than those who are of a turbulent disposition. To render them docile, they ought to be gently treated, frequently handled when young, and never struck or frightened. Some degree of hardiness, however, a sound constitution, and a moderate degree of life and spirits, are qualities to be wished for in a milch cow, and what those of Ayrshire generally possess. Some have thought that a cow living on a small quantity of food was a valuable quality, but that will depend upon the quantity of milk given by the cow that eats little compared with those that eat much. If the cow that eats little gives as much milk as the one that eats more, it certainly is a valuable quality; but of this I entertain doubts, which forty years' experience and observation have served to confirm. Speculative writers affirm that some cows will fatten as well, and yield as much milk, when fed on coarse as others will do on rich food. Cows that have been reared and fed on coarse pasture will yield some milk of a good quality, and from which the best butter may be extracted; while a cow that has been reared and fed on much better pasture, would, if turned on that which is bad, give scarcely any milk. With persons living in towns and villages, and keeping but a single cow, with opportunity of grazing on

the commons, and depending mainly on them for food, a good rule is to get their cow, not over the middle size; and from a poorer district of country. If she comes from rich, fertile pastures, she will fall off in her milk, below the quantity which he was assured she had been accustomed to give, and thus disappoint him. If from a poorer district, with the addition of the "slop" from the house and kitchen, and the external signs here laid down, she will be sure to improve. But if a cow that has been accustomed to feed on bad pasture, be put on that which is better, she will greatly increase in milk, and fatten much faster. If two cows of the same age and condition, and which have been reared and fed on food of equal quality, are put, the one on bad food, and the other on that which is good, the latter will yield four times the milk, and fatten four times faster than the former. A cow need not always be fed on green clover, cabbages, and cauliflower; but she will neither fatten nor yield milk if she gets no better fare than rushes, bent, and sage grass.

To ensure the perpetuation of valuable qualities in cows, it is necessary to breed from good bulls of a similar variety to the cows. The heifer or young cow, if properly pastured, should begin to breed at two years, or not beyond two and a half years old. The cow is at her prime at from four to six years, and declines into old age at ten or eleven years, when it is customary to fatten her for market. Dairymen, in selecting cows, prefer those which have had their third or fourth calf when they have attained their fifth or sixth year. The bull is in his prime at three years, and should not be used after eight or nine years old.

Calving.—The cow goes with young nine calendar months, or 270 days, but this length of time is liable to variation, from the effect of circumstances. A calf is most likely to survive and be healthy which has gone exactly the nine months. Cows come into season at different periods of the year, in which state they remain for a few days, after which the affection ceases, but it afterward returns in three or four weeks. The farmer watches the periods, and permits the company of the bull at such a time as will produce the young at the time of the year when grass is plentiful for the nourishment of the mother. This should be an advanced period of spring, for the cow will

require nourishing diet some time before she drops her calf as well as afterwards.

A cow may be kept in milk up to the time of her calving, by daily taking a quantity from her; but this is most injurious to the fœtus, and the excitement of the new upon the old milk is apt to produce local inflammation. In towns, where dairymen care nothing for the calf, and must have milk at all risks, cows are often maltreated by being milked to the last; but no one who conducts a dairy on proper principles will be guilty of this inhumanity. The best plan is to allow the cow to gradually dry, and not milk her at all for six or eight weeks before calving. This will keep her in a reasonably good condition, and save extra food, which it is not advantageous to give on a luxuriant scale, because high feeding at this period may induce inflammation and fever at calving.

No animal is so liable to abortion as the cow; it takes place at uncertain periods during the pregnancy; sometimes it occurs from fright, teazing by other cattle in the field, or over-high condition; but also not unfrequently from from some bad habit acquired by the animal. It has been found that the habit is infectious; and, when once it has got among a parcel of cows, it can be banished only with the greatest difficulty. In all cases the aborted fœtus should be buried deep and far from the cow pasture; the cow physickeb, and its parts washed with chloride of lime; the cow-house thoroughly lime-washed and otherwise purified; and, lastly, the cow fattened and sent to market.

If in a state of health, no difficulty will occur at the parturition; but, should the case be otherwise, we prefer leaving the cow-keeper to ask assistance from a person of practical skill, or veterinary surgeon, than to offer any speculative advice on the subject. With respect to the treatment after calving, we quote the following directions: "Parturition having been accomplished, the cow should be left quietly with the calf; the licking and cleaning of which, and the eating of the placenta, if it is soon discharged, will employ and amuse her. It is a cruel thing to separate the mother from the young so soon; the cow will pine, and will be deprived of that medicine which nature designed for her in the moisture which hangs about the

calf, and even in the placenta itself; and the calf will lose that gentle friction and motion which help to give it the immediate use of all its limbs, and which increases the languid circulation of the blood, and produces a genial warmth in the half-exhausted and chilled little animal. A warm mash should be put before her, and warm gruel, or water from which some of the coldness has been taken off. Two or three hours afterward, it will be prudent to give an aperient drink, consisting of a pound of epsom salts and two drachms of ginger. This may tend to prevent milk fever and garget in the udder. Attention should likewise be paid to the state of the udder. If the teats are sore, and the bag generally hard and tender, she should be gently but carefully milked three or four times every day. The natural and the effectual preventive of this, however, is to let the calf suck her at least three times in a day, if it is tied up in the cow-house, or to run with her in the pasture, and take the teat when it pleases. The tendency to inflammation of the udder is much diminished by the calf frequently sucking; or, should the cow be feverish, nothing soothes or quiets her so much as the presence of the little one."

CALVING TABLE.

Day bulled.	Will calve.	Day bulled.	Will calve.	Day bulled.	Will calve.
Jan. 1	Oct. 8	May 7	Feb. 11	Sept. 7	June 15
" 7	" 14	" 14	" 18	" 14	" 22
" 14	" 21	" 21	" 25	" 21	" 29
" 21	" 28	" 28	Mar. 4	" 28	July 6
" 28	Nov. 4	" 31	" 7	" 30	" 8
" 31	" 7	June 1	" 8	Oct. 1	" 9
Feb. 1	" 8	" 7	" 14	" 7	" 15
" 7	" 14	" 14	" 21	" 14	" 22
" 14	" 21	" 21	" 28	" 21	" 22
" 21	" 28	" 28	April 4	" 28	Aug. 5
" 28	Dec. 5	" 30	" 6	" 31	" 8
Mar. 1	" 6	July 1	" 7	Nov. 1	" 9
" 7	" 12	" 7	" 13	" 7	" 15
" 14	" 19	" 14	" 20	" 14	" 21
" 21	" 26	" 21	" 28	" 21	" 29
" 28	Jan. 2	" 28	May 4	" 28	Sept. 5
" 31	" 5	" 31	" 8	" 30	" 7
April 1	" 6	Aug. 1	" 9	Dec. 1	" 8
" 7	" 12	" 7	" 15	" 7	" 21
" 14	" 19	" 14	" 22	" 14	" 21
" 21	" 26	" 21	" 29	" 21	" 28
" 28	Feb. 2	" 28	June 5	" 28	Oct. 5
" 30	" 4	" 31	" 8	" 31	" 8
May 1	" 5	Sept. 1	" 9		

The Calf.—The calf, when first dropped, is generally cleansed by the tongue of its dam from the slimy matter which

always adheres to the skin of the animal. Sometimes it happens that the cow will not at first recognize her offspring; but, upon a small quantity of salt being strewn over it, to which all neat cattle are particularly partial, she commences the motherly duties by licking the skin. The first milk appears to be calculated to nourish the calf, which it should be allowed to suck plentifully before the cow is milked. It is the practice with some, as soon as the calf has sucked as much as it pleases, to milk the remainder, so as to cleanly drain the udder, and give it to the cow as nourishment.

The treatment of calves in rearing varies materially in different countries, and even in districts. In Sussex, England, the calf is by many not allowed to take all the milk of the cow, but is shut up from her in the morning and evening, and a small quantity of bran or ground oats given in a trough, and not suffered to suck till the maid comes to milking, when she milks two speens, while the calf sucks the other two; after which, when the girl has got all the milk she can, the calf is left with the cow a short time, to draw the udder as clean as possible; and if there be any lumps occasioned by the pours being stopped, through which the milk flows to the speens, the calf, by sucking, will disperse them better than by any other means. Cows are frequently injured in their milk by not having their udders thoroughly cleansed for the first fortnight or three weeks after calving. When the calf is about a month old, it is suffered to run with the cow in the day, and kept from her in the night. A portion of the milk is taken from the cow, and the remainder is left for the calf, which is again permitted to remain with her during the day; this practice is followed by some till the calf is weaned. Some let the calves go with the cows when three or four weeks old, at which time the cow has not a greater supply than sufficient for the calf alone; after which it is allowed to run with the cow till about twelve weeks, when it is weaned, and put in a confined place out of sight and hearing, to prevent the cow from being made uneasy from hearing her calf. The calf is then fed on cut grass, clover, or other green food, with hay and bran, till such time as it forgets its dam. It should then be turned out upon good pasture; for, unless the calf be well fed at an early age, it will become

stinted in its growth, and when arrived at maturity, will not fatten so readily as if proper attention had been paid to it while young.

In many dairy districts it has been found desirable to deprive the calf of the greater portion of milk; which has been accomplished by its being taught to drink skimmed milk in a lukewarm state, by the following means: When the animal has fasted two or three hours, the first and second fingers of the right hand are presented to its mouth; of these it readily takes hold, sucking very eagerly; in the meantime a vessel of lukewarm milk is placed and supported by the left hand under the calf's mouth; and, while it is sucking, the right hand is gradually sunk a little way into the milk, so that it may draw in a sufficient quantity without stopping the nostrils. Should, however, either from accident or from too sudden precipitation of the hand into the milk, the calf let go its hold, the attempt must be repeatedly renewed till crowned with success. For the space of three or four weeks, they are usually fed with lukewarm milk and water. A small quantity of hay, ground oats, or bran, and sometimes oil-cake, is then placed within their reach, which induces them to eat. Toward the end of May they are turned out to grass, being taken in for a few nights, when they have tepid milk and water given them; which is usually continued, though gradually, in smaller proportions during the last month, till they are able to feed themselves, when they totally disregard it. It is then advisable to turn them into pastures where the grass is short and sweet.

Many attempts have been made to rear calves by artificial means, which by some is said to have answered very well where the animal has been confined and shut up in the dark; this practice has been proved to be injurious, and especially if the calves are intended for stock. We certainly have no practice which can answer so well as that where the laws of nature are strictly attended to, and the calf is supplied with nourishment such as nature dictates.

The greatest attention in fattening calves should be paid to cleanliness, without which neither will the calf fatten quickly, nor will the fat be of good color; much risk will also follow in losing the calf from fever, or from scouring. Chalk should be

always before them to lick, to counteract the acidity always found in great abundance in the stomach of the calf when feeding on milk.

It is advisable in fattening calves to keep them quiet, and to allow them to suck the cow night and morning, taking the last of the milk, which is considered to be the most rich and nourishing. By this treatment the calf will gradually become sufficiently fat in seven or eight weeks; and, when so, it is no advantage to keep it a day longer—as small veal, if fat, is preferable to large.

It is by some a practice to bleed calves weekly, after they are four or five weeks old, and always a short time before they are killed—by which course the veal is rendered whiter.

As castrating calves is an operation which ought not to be performed but by skillful practitioners, we shall refrain from giving any directions—recommending the operation to be performed at the age of eight or ten weeks, as at that age the danger is considerably lessened. The animals should be kept quiet and warm after the operation; and if, on the following day, the scrotum should be much swollen and inflamed, the wound may be opened, and coagulated blood removed.

Whether calves are kept for veal or for stock, they are begun to be fed in the same manner, by sucking milk from a dish. As they naturally seek for the teat when their nose is put to the dish, the fingers of the attendant may be put into their mouth when in the milk, and this will set them going in the art of artificial sucking. The milk should be given to them sparingly at first, to render their appetite more keen, and prevent them from loathing at their food. For the first two weeks they should be fed on the milk first drawn from the cow, locally termed the forebroads, which abounds with serum; and, as they grow up, the quantity of milk is gradually increased to as much as the calves can be made to drink. After the first two or three weeks, by all means give them plenty of milk, warm from their mother; and let it be that which is last drawn from the cow, locally termed afterings, which are much richer. Keep abundance of dry litter under them. Have them in a place that is well aired, and of a uniform temperature, neither too hot nor too cold; let the apartment be quite dark, excepting when the

door is opened to give them food. If they enjoy the light they become too sportive and will not fatten. Take care that they are fastened to the wall in such a way, by "swivels," that they cannot hang themselves. Never let them make their escape at the door, or, by their running and jumping, they will do more injury to themselves in three minutes than a week's feeding will make up. Don't keep them till they become too old, because, when they begin to grow to the bone, they require more milk than the manse can generally produce ; and, whenever they cease to advance in the fattening process, they begin to recede, and the milk for a week or two is lost. They should be kept from four to seven weeks, according as milk may be abundant and rich. If a calf be kept long, during the last two or three weeks, it will require the richest part of the milk of at least two or three cows to bring it to the highest pitch of fatness. When the milk begins to fall short of the calf's appetite some mix eggs and others peas-meal into their food; others try infusions of hay, oil-cake and linseed ; but none of these additions are approved of by those who feed calves to the greatest perfection. Meal is understood to darken the flesh, web and lights of the animal ; but sago has of late years been almost from the first two or three weeks, boiled and mixed in its liquid state with the milk, and to great advantage. Begin with a saucerful of it or so, and gradually increase the quantity. Calves are very fond of chalk, and they also feel the want of salt.

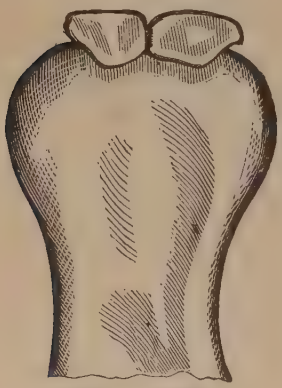
Formation of Teeth.—It is of the utmost importance to be able to judge of the age of a cow. Few farmers wish to purchase a cow for the dairy after she passed her prime, which will ordinarily be at the age of nine or ten years, varying, of course, according to care, feeding, &c., in the earlier part of her life.

The common method of forming an estimate of the age of cattle is by an examination of the horn. At three years old, as a general rule, the horns are perfectly smooth; after this, a ring appears near the nob, and annually afterward a new one is formed, so that, by adding two years to the first ring, the age is calculated. This is a very uncertain mode of judging. The rings are distinct only in the cow, and it is well known that if

a heifer goes to bull when she is two years old, or a little before or after that time, a change takes place in the horn, and the first ring appears; so that a real three-year-old would carry the mark of a four-year-old.

The rings on the horns of a bull are either not seen until five, or they cannot be traced at all; while in the ox they do not appear till he is five years old, and then are often very indistinct. In addition to this, it is by no means an uncommon practice to file the horns, so as to make them smooth, and to give the animal the appearance of being much younger than it really is. This is, therefore, an exceedingly fallacious guide, and cannot be relied upon by any one with the degree of confidence desired.

The surest indication of the age in cattle, as in the horse, is given by the teeth.



TEETH AT BIRTH.

SECOND WEEK.

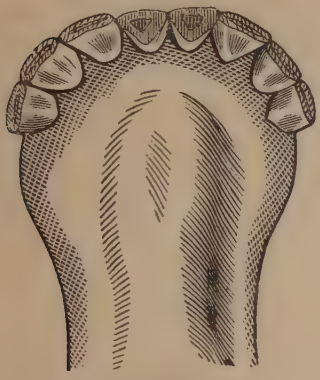
The calf, at birth, will usually have two incisor or front teeth—in some cases just appearing through the gums; in others, fully set, varying as the cow falls short of, or exeeeds, her regular time of calving. If she overruns several days, the teeth will have set and attained considerable size, as appears in the cut representing teeth at birth. During the second week a tooth will usually be added on each side, and the mouth will generally appear as in the next cut; and before the end of the third week, the animal will generally have six incisor teeth, as denoted in the cut representing teeth at the third week; and

in a week from that time the full number of incisors will have appeared, as seen in the next cut.

THREE WEEKS.

MONTH.

These teeth are temporary, and are often called milk-teeth. Their edge is very sharp; and, as the animal begins to live upon more solid food, this edge becomes worn, showing the bony part of the tooth beneath, and indicates with considerable pre-



FIVE TO EIGHT MONTHS.

TEN MONTHS

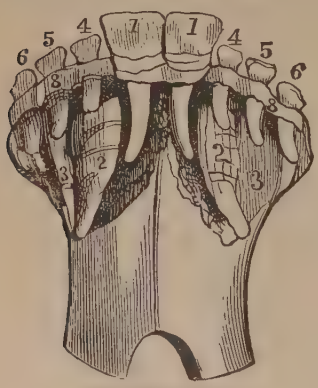
cision the length of time they have been used. The centre, or oldest teeth show the marks of age first, and often become somewhat worn before the corner teeth appear. At eight weeks, the four inner teeth are nearly as sharp as before. They appear worn not so much on the outer edge or line of the

tooth, as inside this line; but, after this, the edge begins gradually to lose its sharpness, and to present a more flattened

TWELVE MONTHS.

FIFTEEN MONTHS.

surface; while the next outer teeth wear down like the four central ones; and, at three months, this wearing off is very apparent, till at four months all the incisor teeth appear worn,



EIGHTEEN MONTHS.

TWO YEARS PAST.

but the inner ones the most. Now the teeth begin slowly to diminish in size by a kind of contraction, as well as wearing down, and the distance apart becomes more and more apparent.

From the fifth to the eighth month, the inner teeth will usually appear as in the cut of the teeth at that time; and at ten months this change shows more clearly, as represented in

the next cut, and the spaces between them begin to show very plainly, till at a year old they ordinarily present the appearance of the particular cut; and, at the age of fifteen months, that

THREE YEARS PAST.

FOUR YEARS PAST.

shown in the next, where the corner teeth are not more than half the original size, and the centre ones still smaller.

The permanent teeth are now rapidly growing, and preparing to take the place of the milk teeth, which are gradually

FIVE YEARS PAST.

TEN YEARS PAST.

absorbed till they disappear, or are pushed out to give place to the two permanent central incisors, which, at a year and a half, will generally present the appearance indicated in the cut, which shows the internal structure of the lower jaw at this

time, with the cells of the teeth, the two central ones protruding into the mouth, the next two pushing up, but not quite grown to the surface, with the third pair just perceptible. These changes require time; and at two years past the jaw will usually appear as in the cut, where four of the permanent central incisors are seen. After this the other milk-teeth decrease rapidly, but are slow to disappear; and, at three years old, the third pair of permanent teeth are but formed, as represented in the cut; and at four years the last pair of incisors will be up, as in the cut of that age; but the outside ones are not yet fully grown, and the beast can hardly be said to be full-mouthed till the age of five years. But before this age, or at the age of four years, the two inner pairs of permanent teeth are beginning to wear at the edges, as shown in the cut; while at five years old the whole set becomes somewhat worn down at the top, and on the centre ones a dark line appears in the middle, along a line of harder bone, as appears in the appropriate cut.

Now will come a year or two, and sometimes three, when the teeth do not so clearly indicate the exact age, and the judgment must be guided by the extent to which the dark middle lines are worn. This will depend somewhat upon the exposure and feeding of the animal; but at seven years these lines extend over all the teeth. At eight years, another change begins, which cannot be mistaken. A kind of absorption begins with the two central incisors—slow at first, but perceptible—and these two teeth become smaller than the rest, while the dark lines are worn into one in all but the corner teeth, till, at ten years, four of the central incisors have become smaller in size, with a smaller and fainter mark, as indicated in the proper cut. At eleven, the six inner teeth are smaller than the corner ones; and, at twelve, all become smaller than they were, while the dark lines are nearly gone, except in the corner teeth, and the inner edge is worn to the gum.

Cow-House.—The cow-house should be airy and well ventilated; of moderate temperature, and kept very clean. The stalls for the cows should be paved with smooth stones, slope gently toward the foot, where there should be a clear run of a gutter to carry off the urine to a pit outside. The stalls must be daily scraped and swept, and all refuse carried out to the

dung-heap. In general, far too little litter is allowed. The cow should have plenty of straw bedding, kept in a cleanly condition; and this, when soiled, is to be mixed with the dung for manure. The only fastening for the cow should be a chain to go round the neck, with the other end round an upright post, but easily movable up and down, and allowing room for the animal shifting its position. The feeding manger or stone trough is on the ground, and ought to be kept free of all impurities; for, though the cow is not so nice as the horse, it has a disinclination for food not fresh and cleanly.

Except in dairies of a high order, it is customary to keep cows in a shamefully unclean condition. The floor of their habitation is filthy, the walls ragged and full of vermin, and the hides of the animals dusty or darkened with dirt. Persons who keep cows are not aware of the loss they incur from allowing them to live in this uncleanly state. Some people seem to think that they do quite enough for their cows if they give them food and shelter; but besides this they require to be kept very cleanly, though seldom indulged in that luxury. The cow should be curried daily like the horse; its hide should be freed from all impurities, and relieved from everything that causes uneasiness. When you see a cow rubbing itself against a post, you may depend on it that the animal is ill kept, and requires a good scrubbing. Irritation of the skin from impurities also causes them to lick themselves, a habit which is injurious, for the hairs taken into the stomach form a compact round mass, which may destroy the animal. If well curried, any danger from this catastrophe is avoided, the health is generally improved, and this improves the quality of the milk, besides increasing the quantity.

Feeding.—The cow requires to be supplied with an abundance of food, not to make her fat, which is not desirable, but keep up a regular secretion of milk in the system. The feeding must be regular, from early morning to night, and pure water must also be offered at proper intervals, if the cow has not the liberty of going to the water herself.

Regarding the nature of the food of cows, although soiling, or artificial feeding in the house, is at all times economical, there can be no doubt that the best milk and butter are produced by

cows fed on natural pasture; and, although the quantity of milk is not so great, yet the butter has a sweeter taste, never to be discovered in the produce of soiled cows. On well-enclosed farms, it is the custom of many to keep their cows out, both night and day, from May till the end of October, so long as a full bite can be obtained; and some bring them into the house twice a day to be milked. Soiling, or feeding entirely in the house or court-yard, is but seldom practiced, except by some farmers in arable districts. Although complete soiling is only occasionally resorted to, yet a considerable quantity of rich, green food is served out to the dairy stock in their stalls at night, and in the heat of the day, by such farmers as bring their cows into the house at these times. This mode of feeding is more especially followed when the pasture begins to fail; the second crops of clover and tares, cabbages, coleworts, and other garden produce, are all given to the cows in the house at this period. Dairy cows are allowed to be much injured by being denied a due supply of salt, which is said to improve the quality and increase the quantity of milk. In the best managed dairies in Scotland, when the cows are taken in for the winter, they are never put out to the fields until spring, when the grass has risen so much as to afford a full bite. In the moorish districts, however, they are put out to the fields for some hours every day when the weather will permit. In these districts, the winter food is turnips with marsh meadow hay—occasionally straw and boiled chaff

In the richer districts, turnips and straw are given, and occasionally some clover hay in the spring or when the cows have calved. Upon this subject nothing need be added, but that the quantity and quality of the milk will be in proportion to the nourishment in the food. White turnips afford a good quantity of milk, but they impart a very disagreeable taste, which may be removed, however, by steaming or boiling the turnips, or by putting a small quantity of dissolved saltpetre into the milk when new drawn. The quality of the milk depends a great deal upon the cow; influenced, however, by the food she eats. Linseed, peas and oat-meal produce rich milk; and a mixture of bran and grains has been recommended as food in winter. Brewers' grains are said to produce a large

quantity of milk, but very thin—the quality being somewhat similar to that sold in large towns, yielding neither good cream nor butter. It has been found of some importance to feed cows frequently—three or four times a day in summer, and five or six in winter—and to give them no more at a time than they can eat cleanly.

What has been stated regarding the feeding of cows applies principally to those kept on dairy farms. In establishments for the supplying of large towns with milk, the method of feeding is somewhat different; there the practice is to feed them chiefly on distillers' wash, brewers' grains, and every sort of liquid stuff that will produce a large quantity of milk, without reference to the quality.

The following is an improved mode of feeding milch cows in Surrey: "Go to the cow-stall at six o'clock in the morning, winter and summer; give each cow half a bushel of the mangel-wurzel, carrots, turnips or potatoes cut; at seven o'clock, the hour the dairy maid comes to milk them, give each some hay, and let them feed till they are all milked. If any cow refuses hay, give her something she will eat—such as grain, carrots, etc., during the time she is milking, as it is absolutely necessary the cow should feed while milking. As soon as the woman has finished milking in the morning, turn the cows into the airing grounds, and let there be plenty of fresh water in the troughs; at nine o'clock give, each cow three gallons of the mixture (as under—to eight gallons of grains, add four gallons of bran or pollard); when they have eaten that, put some hay into the cribs; at twelve o'clock, give each three gallons of the mixture, as before. If any cow looks for more, give her another gallon. On the contrary, if she will not eat what you gave her, take it out of the manger; for never, at one time let a cow have more than she will eat up clean. Mind and keep your mangers clean, that they do not get sour. At two o'clock, give each cow half a bushel of carrots, mangel wurzel, or turnips; look the turnips, etc., over well, before you give them to the cows—as one rotten turnip, etc., will give a bad taste to the milk, and most likely spoil a whole dairy of butter. At four o'clock, put the cows into the stall to be milked; feed them on hay as you did at milking time in the morning, keeping in mind

that the cow, while milking, must feed on something. At six o'clock, give each cow three gallons of the mixture as before. Rack them up at eight o'clock. Twice in a week, put into each cow's feed at noon a quart of malt dust.

So much of the value of any food depends on the condition in which, and the circumstances under which, it is fed, that it is impossible to make a comparison which shall at all times hold good; but the following tables, giving as they do the results of a number of carefully conducted experiments, will be found valuable:

TABLE, *showing the comparitive difference between good hay ana the articles mentioned below, as food for stock—being the mean of experiment and theory.*

100 lbs. of hay are equal to			100 lbs. of hay are equal to		
275	lbs.	green Indian corn.	54	lbs.	rye.
442	"	rye straw.	46	"	wheat.
360	"	wheat straw.	59	"	oats.
164	"	oat straw.	45	"	peas and beans mixed.
180	"	barley straw.	64	"	buckwheat.
153	"	pea straw.	57	"	Indian corn.
200	"	buckwheat straw.	68	"	acorns.
201	"	raw potatoes.	106	"	wheat bran.
175	"	boiled "	109	"	rye "
339	"	mangel-wurzel.	167	"	wheat, pea and oat chaff.
504	"	turnips.	179	"	rye and barley mixed.
300	"	carrots.			

Milking.—Cows are milked twice or thrice a day, according to circumstances. If twice, morning and night; if thrice, morning, noon and night. They should not go too long unmilked, for, independently of the uneasiness to the poor animal, it is severely injurious.

The act of milking is one which requires great caution; for, if not carefully and properly done, the quantity of the milk will be diminished, and the quality inferior, the milk which comes last out of the udder being always the richest. It should, therefore, be thoroughly drawn from the cows until not a drop more can be obtained, both to ensue a continuance of the usual supply of milk, and, also, to get the richest which the cows afford. Cows should be soothed by mild usage, especially when young; for to a person whom they dislike, they never give their milk freely. The teats should always be clean washed before milking, and, when tender, they ought to be fomented with warm water. The milking and management of the cow should, in these circumstances, be only entrusted to

servants of character, on whom the utmost reliance can be placed. In some places, it is a common practice to employ men to milk the cows, an operation which seems better fitted for females, who are likely to do the work in a more gentle and cleanly manner, which is of essential importance.

A writer gives the following explicit directions to the dairy-maid in regard to milking: "Go to the cow-stall at seven o'clock; take with you cold water and a sponge, and wash each cow's udder clean before milking; dowse the udder well with cold water, winter and summer, as it braces and repels heats. Keep your hands and arms clean. Milk each cow as dry as you can, morning and evening, and when you have milked each cow as you suppose dry, begin again with the cow you first milked, and drip them each; for the principal reason of cows failing in their milk is, from negligence in not milking the cow dry, particularly at the time the calf is taken from the cow. Suffer no one to milk a cow but yourself, and have no gossiping in the stall. Every Saturday night give in an exact account of the quantity of milk each cow has given, in the week."

The Dairy, and Dairy Produce.—The dairy should be cool, airy, dry, and free from vermin of all kinds. To prevent the intrusion of flies, the windows or ventilators ought to be covered with a fine wire gauze. The floor should be laid with smooth glazed tiles, and also the lower part of the walls; the benches on which the milk pans are to be placed are best when made of stone or slate, and about thirty inches broad. The ceiling should be at least eight feet from the floor, and finished in every respect like that of an ordinary dwelling house. A slate roof is preferable to one of tile, as it tends to keep the temperature more equable. Cleanliness is of the most essential consequence in dairy management, and, if not strictly looked after, may cause considerable loss. It is this which has raised the produce of the dairies of Holland so much in public estimation. Every article in which milk is placed, more especially when made of wood, ought to be washed in boiling water, with a little soda or lime dissolved in it. If milk should happen to sour in any dish, the acid thus generated will injure any which may be afterward put into it; but, if washed in water in which an alkali has been dissolved, the acid will be destroyed.

The utensils of a dairy are very numerous. The principal are milk-pails, shallow coolers for holding the milk, sieves for straining it through after it is taken from the cow, dishes for skimming the cream, churns for making the butter, scales, weights, &c. For making cheese, there are likewise ladders, vats, tubs, curd-breakers and presses; and various other articles will be required, which it is almost impossible to enumerate. The majority of them are made of wood; but in some of the best dairies in England and Scotland, it is now the practice to have the coolers made of cast-iron, wood lined with tin in the inside, or glazed earthenware. Maple is the wood generally used in England for the manufacture of these dishes; both from its lightness and being easily cut, it can be finished in a neater style. In Holland the milk-dishes are very commonly made of brass; and certainly brass or iron is to be preferred to wood, because the dishes made from either of these materials are more durable, and can be easier cleaned. It has been objected to earthenware vessels, that, being glazed with lead, the acid of the milk acting upon the glaze, forms a very noxious poison. This, however, is scarcely correct; it would require a much stronger acid than that of milk to decompose the glaze. Zinc pans are now coming into use, and they can be safely recommended for their cool and cleanly qualities, besides being economical. We have seen it stated that cream rises best in zinc pans.

Churning is now, in all large dairy establishments, performed by machinery, worked either by horse or water power. Churns vary in size from ten to fifty, and even one hundred, gallons, according to the size of the establishment. Great care should be taken to wash churns thoroughly with boiling water, both immediately after they have been used, and before they are again to be put in operation ; and those churns which admit of being easily cleaned are always to be recommended, even although they should not be so elegant in construction.

Milk.—Milk consists of three materials blended together which can be separated by artificial means, so as to form butter, the milk called buttermilk, and serum or whey. The whey is little else than water, slightly saline, and is generally the chief

ingredient in the milk. When taken from the cow, milk should be removed to the dairy or milk-house, and, after being sieved, placed in shallow pans, to throw up the butteraceous matter termed cream, which, being lightest, floats on the top.

The following observations on milk and its management are worthy of the consideration of cow-keepers:

"Of the milk drawn from any cow at one time, that part which comes off at the first is always thinner, and of a much worse quality for making butter, than that afterward obtained; and this richness continues to increase progressively to the very last drop that can be obtained from the udder.

"If milk be put into a dish, and allowed to stand till it throws up cream, the portion of cream rising first to the surface is richer in quality and greater in quantity than that which rises in a second equal space of time; and the cream which rises in the second interval of time is greater in quantity and richer in quality than that which rises in a third equal space of time; that of the third is greater than that of the fourth, and so of the rest; the cream that rises continuing progressively to decrease in quantity, and to decline in quality, so long as any rises to the surface.

"Thick milk always throws up a much smaller proportion of the cream which it actually contains than milk that is thinner; but the cream is of a richer quality; and, if water be added to that thick milk, it will afford a considerably greater quantity of cream, and consequently more butter, that it would have done if allowed to remain pure; but its quality is, at the same time, greatly debased.

Milk which is put into a bucket or other proper vessel, and carried in it to a considerable distance, so as to be much agitated, and in part cooled, before it be put into the milk-pans to settle for cream, never throws up so much or so rich cream as if the same milk had been put into the milk-pans directly after it was milked.

"From these fundamental facts, the reflecting dairist will derive many important practical rules. Some of these we shall enumerate, and leave the rest to be discovered. Cows should be milked as near the dairy as possible, in order to prevent the necessity of carrying and cooling the milk before it is put into

the creaming dishes. Every cow's milk should be kept separate till the peculiar properties of each are so well known as to admit of their being classed, when those that are most nearly allied may be mixed together. When it is intended to make butter of a very fine quality, reject entirely the milk of all those cows which yield cream of a bad quality, and also keep the milk that is first drawn from the cow at each-milking entirely separate from that which is last obtained, as the quality of the butter must otherwise be greatly debased, without materially augmenting its quantity. For the same purpose, take only the cream that is first separated from the first drawn milk. Butter of the very best quality can only be economically made in those dairies where cheese is also made; because in them the best part of each cow's milk can be set apart for throwing up cream —the best part of this cream can be taken in order to be made into butter—and the remainder or all the rest of the milk and cream of the dairy can be turned into cheese. The spontaneous separation of cream, and the production of butter, are never effected but in consequence of the production of acid in the milk. Hence it is that, where the whole milk is set apart for the separation of cream, and the whole of the cream is separated, the milk must necessarily have turned sour before it is made into cheese; and no very excellent cheese can be made from milk which has once attained that state."

Butter.—Butter is made of cream, freed from its milky and serous properties. This is effected by churning. Some imagine that no butter can be good except such as is made from fresh cream; but this is a mistake, as cream requires to have a little acidity before the butter will form. The length of time which the cream should stand before churning has never been clearly ascertained; from three to seven days, however, may be considered as the proper period. A more important matter than the length of time which cream requires to stand, is the degree of temperature at which the cream will turn into butter. This has been ascertained from experiment to be from 45 to 75 degrees of Fahrenheit. The best quality of butter is obtained at a temperature of 51 degrees, according to experiments, and the greatest quantity at a temperature of 56 degrees. During the process of churning, the agitation will increase the heat to

about five degrees more than it was when the cream was put into the churn.

In some of the dairies in the neighborhood of Edinburgh, and in all those near Glasgow, the butter is made by churning the cream and milk together. This is done in order to obtain the buttermilk, the demand for which is always great in large cities. When the milk and cream are to be churned together, the milk is kept in the coolers for from twelve to twenty-four hours, and then poured into a milk-tub. It remains here until required for churning; and will, during this time, have coagulated. If a certain quantity of milk is put into the milk-tub, and has coagulated before any more has creamed, the coagulated milk must in no way be disturbed, or, if the two quantities are mixed together, too much fermentation may be the consequence. The milk is not churned till it has become acid; and, when once coagulation has taken place, it should be churned as early as convenient. If the milk has not fermented before churning, the buttermilk will keep for a much longer time, will have an agreeable taste, and will bear to be mixed with a little water. When the milk has fermented before being churned, the buttermilk will never be so good nor will it keep for such a length of time as the former.

The operation of churning, whether it be of cream alone, or cream and milk, is performed in the same manner. The milk requires more time than cream to complete the process, from two to three hours being considered necessary, while cream alone may be effectually churned in an hour and a half. It is necessary that the operation should be slow in warm weather; for, if done too hastily, the butter will be soft and white. If the cream is at too high a temperature, the churn should be cooled with cold spring water, to reduce it to the proper degree of heat. In winter, again, the operation of churning should be done as quickly as possible, the action being regular; and the churn should be warmed, to raise the temperature of the milk or cream. The air which is generated in the churn should be allowed to escape, or it will impede the process by the froth which it creates.

After the churning is performed, the butter should be washed in cold spring water, with a little salt in it, two or three

times, to extract all the milk which may be lodged about the mass. It is said by some that the butter retains its sweetness much longer when no water is used; and others affirm that the washing improves the flavor. The extraction of the milk from butter will reduce its weight; but it appears from the experiments upon the temperature of the cream, that the less milk which is in the butter its quality is proportionately improved. Kneading and beating the butter too much render it tough and gluey. After the milk has been carefully extracted, if the butter is to be salted, it should be mixed with the finest salt, in the proportion of ten ounces to fourteen pounds, more or less, according to the time the butter is to be preserved. The butter and salt should be well mixed together with the hand; and in Ireland it is customary to add a little saltpetre. A compound of one part of sugar, one part nitre, and two parts of the best Spanish salt, finely powdered together, has been highly recommended for preserving butter. It is used in the proportion of one ounce to the pound; and it is said to give a flavor to the butter which no other kind ever acquires.

For making butter casks or kegs, the wood of trees containing no acid is recommended. When wood contains acid it acts powerfully upon the salt in the butter, converting it into brine. Any wood will answer if boiled for a few hours, for by this process the pyrolignous acid will be entirely taken out.

In salting, the butter should never be put into the firkins in layers; but the surface should be left every day rough and broken, so as to unite better with that of the succeeding churning. The quality may likewise be better preserved by covering it over with a clean linen cloth dipped in pickle, and placing it in a cool situation.

Marketing.—Marketing butter by many is thought to be the easiest part of the whole process, or the least important, judging by the manner in which it is done. But marketing it in the proper manner, or to make it the quickest selling, is half the battle. It should be put into the most inviting form to gain the best price. If the maker is near a market, and is about to retail it, or sell it to those who are to retail it, it should be put into half-pound or pound lumps, and printed or stamped with some emblematic device, such as a sheaf of wheat, a cow, bee-

hive, or the maker's initials. After the final working, the scales are placed handy, and with the clapper a lump is cut off, placed upon the scales, and either added to or taken from, always being sure to give rather over than under a pound. It is then taken from the scale by one clapper, in the right hand, and with the other clapper in the left, it is worked over into a ball by a few expert touches; and, while held on the left-hand clapper, the right-hand one having been exchanged for the stamp-mould, the mould is dipped in cold water to prevent its sticking to the lump, and then pressed firmly upon it, then withdrawn, leaving a beautiful raised impression of the stamp upon it, and adding to its attractions. The fashion is now becoming prevalent of making the lumps square, which is more convenient for use and for packing in the market tray. It is also more convenient for the butter-maker, as it is done by a machine which squares and prints it at one operation, and also marks it, so that the consumer cuts it in four parts, of about the right size for table, each piece being nicely stamped.

When it is all stamped, it is set aside in a cold place to thoroughly harden; in a tray in the spring-house water is best. When about to market it, each pound or roll is wrapped in a linen cloth taken out of ice-water or cold spring-water, and laid upon the shelf of the tray or tub. Some market men have a square box made with a sliding lid and several shelves. On these shelves the pounds of butter are placed, the lid is dropped down in its grooves, as the box stands upright on one end, with a handle to carry it by on the other. This is very nice for winter use, when the butter will keep hard until sold; but for summer use there is provided a large tub made of cedar, with an inner tin vessel, with a well in each end for broken ice, and shelves on each side of them, one above the other, on which the butter is placed, and is removed as it is sold. The shelves are made of thin wood, and rest upon tin projections on the side about three inches apart. The wooden tub is cooled in ice or spring-water while the tin vessel is being filled with the ice and butter. The tin is then set into the wooden vessel, the lid closed, and the whole enveloped in a padded carpet covering made to fit, and again enclosed in an oil-cloth covering. It is thus effectually shielded from hot air and dust, and is opened

out to the customer firm, cool and golden, and brings readily in cities its seventy-five cents to one dollar and twenty-five cents per pound, thus well paying for the extra care. Many put up their butter in rolls of five or ten or more pounds, and sell it so, sometimes wrapped in muslin, sometimes not; but, either way, it never looks so nice and attractive as the nicely-stamped pound lumps, and, of course, does not bring so good a price.

In general terms, it may safely be said that the less possibility there is of interfering with the condition of the butter, from the time it leaves the dairy till it reaches the larder, the better for both producer and consumer. To alter the condition of butter by redressing, or repacking, is commercially culpable, whilst the introduction of any other substance, however innocuous, is fraudulent adulteration. To prevent both effectively, is to pack the butter, at the dairy, in the several quantities to suit the requirements of larger or smaller households or dealers. These packages ought only to be opened for examination as to quality; the butter would in such a way be fully protected from injury, and as it left the dairy so it reaches the larder.

Packing and Shipping.—Packing of the butter for shipping should be done not later than the third day. Be careful before packing there is no milky water runs from it, for, as sure as it is packed with the least drop in the butter, you will hear from it next March or April. Pack it down solid in stone jars, if for your own winter use, or in firkins, if for shipping. Sprinkle a little salt on the surface, and, covering it with a thick, fine cloth, put on the lid and place the jar in a dry, cool place. It is better to fill the vessel with one churning; but, if not able to do so, pack in each churning solid, and exclude the air until it is full, by pouring over it a strong brine, to be poured off when ready to be filled. If it is to be kept a long while, or sent to sea, pour a little melted butter over the top of the jar before you put on the cloth. Butter put down this way in September or October, when the weather is cool and the quality of food is best, will keep till next June as good as newly-churned butter.

When exposed for sale, it is often found that the lower por-

tion of the contents of the tub is the poorest, and the discovery of this fact causes not only a diminution of price on the whole package, but also suspicion of intended deception. Yet no deception has been intended. The difference in quality has arisen from improper management of the lower layers, the upper layer having been kept in good condition by carefully covering it with salt when placed in the tub. When forwarded to market, in warm weather, this imperfectly packed butter is placed in the low temperature of an ice-car, and, on its arrival at the city depot, it is often unloaded and carted under a broiling sun.

It is very important that it should be kept from the air, as an exposure to the atmosphere will spoil the best butter that ever was made in a very short time. For this reason wooden tubs are not desirable to pack in, unless for a short time, as they are not sufficient protection against the action of the atmosphere, and often of themselves destroy the flavor of that portion of butter which comes in contact with them to the depth of an inch or more. When they are used, they should be of hemlock or of oak, filled with boiling water, to remain till cool, then soaked in brine for two or three days, and, after the brine is poured out, the sides and bottom must be rubbed with fine salt.

Makers of large quantities of butter, who store it and ship it when the market price is highest, after preparing the firkins as before described, pack the firkin full of butter, spread a cloth over the top, do not let the cloth expand over the sides, put a layer of coarse Turk's Island salt, washed clean, upon the cloth, and put on temporary tops of round flat stones, as they keep the temperature cooler and more even than any other cover. The firkins are then stored in a cool place, better on open joists where the air can pass underneath them. When they are shipped for market, the cloth, with the salt, is lifted off, the firkin is turned down to let the brine drain off, the cloth, wrung out in brine, is replaced, and they are headed for market, where they arrive in sweet nice order.

Butter from Whey.—Excellent butter, fit for the table, is said to have been made from whey, and sold in the New York market, bringing the best price. The following are two recipes

for making it, but we doubt whether it will pay well, and, if so, only at the factories, if properly managed:

I. The Heating Process.—After separating the whey from the curd, place it in a tin vat and add a liquid acid, the vat with copper bottom and tin sides, about twelve feet long, three feet wide and twenty inches deep, or about these proportions; set over a brick arch; one gallon to the whey of fifty gallons of milk, if the whey is sweet, but less quantity .if changed. Then bring it to a heat of 210 deg. When the cream rises and is skimmed off, and placed in a cool place, let it stand till next day. Then churn at a temperature of 56 deg. to 68 deg., depending on the weather; work and salt it as usual. It will produce about one pound of butter from the whey of one hundred and fifty pounds of milk. The acid is made by taking any quantity of whey at boiling heat, after the cream is extracted, adding one gallon of strictly sour whey, when all the caseine remaining in the whey is collected together in one mass, and is skimmed off. After the whey is allowed to stand from twenty-four to forty-eight hours, it is ready for use as acid. This process is repeated as often as necessity requires

II. The Cooling Process.—Take a vessel made of zinc, or at least with a zinc bottom, about fifteen inches high, three feet wide and as long as desired; set the vessel in cold water and put in the whey, with a handful of salt to every ten gallons of whey. During the first two hours stir it up thoroughly from the bottom every fifteen minutes; afterwards let it stand quiet for about twenty hours, and then skim it; then churn the cream, keeping it at about 58 deg. If above 60 deg., cool it; if below 56 deg., warm it. Churn it till the butter becomes granulated about the size of kernels of buckwheat. Let it stand about five minutes, then let the buttermilk run off; then throw on cold water. If not hard enough, let it stand until it becomes so before it is stirred much. Then rinse with cold water until it runs off clear; then churn together or "gather" it; press the water out, salt it, one pound to eighteen or twenty, and let it stand till next day; then work it until it becomes perfectly even in color. Get it ready for market.

Comparative Profits of Butter Making.—Of the four ways of realizing from milk—butter cheese condensed milk and

milk for family use—butter, if properly made, is the most profitable. In the form of condensed milk, at prices hitherto obtained, a quart of milk reduced by evaporation to one-fourth its bulk yields about half a pound in weight and realizes fifteen cents, at the rate of three dollars and fifty cents per dozen for pound cans; from which deduct one-third for cans and manufacturing, leaving ten cents per quart for the milk. At fifteen cents for cheese, requiring four and a half quarts for a pound, and forty-five cents for butter, requiring eleven quarts, the product would realize four cents per quart for cheese and four and a half for butter, less cost of making; and, if butter and skim-cheese are made, it will show five cents per quart. Where the milk is sold and the butter is sold, both being near good markets, and both of good quality, butter at fifty cents pays a better profit, equal to ten per cent. The superior manner in which cheese has been made of late years has more than trebled the foreign and home demand for it, and, consequently, as the increase of the manufacture of butter has not increased with the population, there is a scarcity of butter, and the prices have risen proportionately.

The following averages of milk required for one pound of butter are the results of careful tests made during one week in each month from March, 1871, to January, 1872, inclusive. Herd of high-grade short-horns:

March.....12.5 quarts.	July.....12.2 quarts.	November.....11.5 quarts.
April.....12.4 "	August ....15 "	December.. ... 9.8 "
May.....12 "	September.....12 "	January.... ..10 "
June.....12.2 "	October.....11.7 "	

Buttermilk.—This is the liquid which remains in the churn after removing the butter. If skimmed milk has been employed for churning, the buttermilk is thin, poor, and easily sours; but if from the churning of the entire milk, the buttermilk is more thick and rich, and is considered by many a delicious beverage. Good buttermilk is, at all events, exceedingly wholesome and nutritious.

Cheese.—Milk, if allowed to become sour, will eventually curdle, when the whey is easily separated; and this simple mode was probably the universal method of making cheese in

ancient times. Cheese, as already explained, is made from caseine, an ingredient of milk held in solution by means of an alkali which it requires the presence of an acid to neutralize. This, in modern manufacture, is artificially added to form the curd; but the acidity of milk, after standing, acts in the same manner to produce coagulation. This is due to the change of the milk-sugar into lactic acid.

All cheese consists essentially of the curd mixed with a certain portion of the fatty matter, and of the sugar of milk. But differences in the quality of the milk, in the proportion in which the several constituents of milk are mixed together, or in the general mode of dairy management, give rise to varieties of cheese almost without number. Nearly every dairy district produces one or more qualities of cheese peculiar to itself. It is obvious that whatever gives rise to natural differences in the quality of the milk must affect also that of the cheese prepared from it. If the milk be poor in butter, so must the cheese be. If the pasture be such as to give a milk rich in cream, the cheese will partake of the same quality. If the herbage or other food affect the taste of the milk or cream, it will also modify the flavor of the cheese. Still further differences are produced according to the proportion of cream which is left in or added to the milk. Thus, if cream only be employed, we have the rich cream cheese, which must be eaten in a comparatively recent state. Or, if the cream of the previous night's milking be added to the new milk of the morning, we may have such cheese as the Stilton of England, or the small, soft, and rich Brie cheeses so much esteemed in France. If the entire milk only be used, we have such cheese as the Cheshire, the Double Gloucester, the Cheddar, the Wiltshire, and the Dunlop cheeses of Britain, the Kinnegad cheese, I believe, of Ireland, and the Gouda and Edam cheeses of Holland. Even here, however, it makes a difference whether the warm milk from the cow is curdled alone, or whether it is mixed with the milk of the evening before. Many persons are of opinion that cream which has once been separated, can never be so well mixed again with the milk; that a portion of the fatty matter shall not flow out with the whey and render the cheese less rich. If, again, the cream of the evening's milk be

removed, and the skimmed milk added to the new milk of the next morning, such cheeses are of inferior quality. If the cream be taken from all the milk, the cheese is still inferior to the last.

Buttermilk Cheese.—But poor or butterless cheese will also differ in quality according to the state of the milk from which it is extracted. If the new milk be allowed to stand to throw up its cream, and this be then removed in the usual way, the ordinary skimmed-milk cheese will be obtained by adding rennet to the milk. But if, instead of skimming, we allow the milk to stand till it begins to sour, and then remove the butter by churning the whole, we obtain the milk in a sour state (buttermilk). From this milk the curd separates naturally by gentle heating. But being thus prepared from sour milk, and without the use of rennet, buttermilk cheese differs more or less in quality from that which is made from sweet skimmed milk. The acid in the buttermilk, especially after it has stood a day or two, is capable of coagulating new milk also, and thus, by mixing more or less sweet milk with the buttermilk, before it is warmed, several other qualities of mixed butter and sweet milk cheese may readily be manufactured. This article is, however, of little use, only when fresh, when it is a healthy and palatable cheese.

Whey Cheese.—The whey separates from the curd, and especially the white whey, which is pressed out towards the last, contains a portion of curd, and not unfrequently a considerable quantity of butter also. When the whey is heated, the curd and butter rise to the surface, and are readily skimmed off. This curd alone will often yield a cheese of excellent quality, and so rich in butter that a very good imitation of Stilton cheese may sometimes be made with alternate layers of new milk curd and this curd of whey.

Rennet.—Rennet is prepared from the salted stomach or intestines of a suckling calf, the unweaned lamb, the young kid, or the young pig. In general, however, the stomach of the calf is preferred, and there are various ways of curing and preserving it. The stomach of the newly killed animal contains a quantity of curd, derived from the milk on which it has been

fed. In most districts it is usual to remove, by a gentle washing, the curd and slimy matters which are present in the stomach, as they are supposed to impart a strong taste to the cheese. The calf should have a copious draught of milk shortly before it is killed, in order that the stomach may contain a larger quantity of the valuable curd.

In the mode of salting the stomach similar differences prevail. Some merely put a few handfuls of salt into and around it, then roll it together, and hang it near the chimney to dry. Others salt it in a pickle for a few days, and then hang it up to dry; while others, again, pack several of them in layers, with much salt both within and without, and preserve them in a cool place till the cheese making season of the following year. They are then taken out, drained from the brine, spread upon a table, sprinkled with salt, which is rolled in with a wooden roller, and then hung up to dry. In some foreign countries, again, the recent stomach is minced very fine, mixed with some spoonfuls of salt and bread-crumb into a paste, put into a bladder, and then dried. In whatever way the stomach or intestine of the the calf is prepared and preserved, the almost universal opinion seems to be that it should be kept for ten or twelve months before it is capable of yielding the best and strongest rennet. If newer than twelve months, the rennet is thought to make the cheese heave or swell, and become full of eyes or holes.

Making the Rennet.—In making the rennet different customs also prevail. The usual way is to take the entire stomachs, and pour upon them from one to three quarts of water for each stomach, and to allow them to infuse for several days. If only one has been infused, and the rennet is intended for immediate use, the infusion requires only to be skimmed and strained. But, if several be infused, as many as have been provided for the whole season, about two quarts of water are taken for each, and, after standing not more than two days, the infusion is poured off, and is completely saturated with salt. During the summer it is constantly skimmed, and fresh salt added from time to time. Or a strong brine may at once be poured upon the skins, and the infusion, when the skins are taken out, may be kept for a length of time. Some even recommend that the liquid rennet should not be used until it is at

least two months old. When thus kept, however, it is indispensable that the water should be fully saturated with salt.

In making rennet, some use pure water only; others prefer clear whey; others a decoction of leaves, such as those of sweet-briar, the dog-rose, and the bramble, or of aromatic herbs and flowers; while others, again, put in lemons, cloves, mace, or whisky. These various practices are adopted for the purpose of making the rennet keep better; of lessening its unpleasant smell; of preventing any unpleasant taste it may give to the curd; or, finally, of directly improving the flavor of the cheese. The acidity of the lemon will, no doubt, increase also the coagulating power of any rennet to which it may be added. The rennet thus prepared is poured into the milk, previously raised to the temperature of 90 degrees or 95 degrees Fahrenheit, and is intimately mixed with it. The quantity which it is necessary to add varies with the quality of the rennet, from a tablespoonful to half a pint for thirty or forty gallons of milk. The time necessary for the complete fixing of the curd varies also from fifteen minutes to an hour, or even an hour and a half. The chief causes of this variation are the temperature of the milk, and the quality and quantity of the rennet employed.

Qualities of Cheese.—The temperature of new or entire milk, when the rennet is added, should be raised to about 95 degrees Fahrenheit; that of skimmed milk need not be quite so high. If the milk be warmer, the curd is hard and tough; if colder, it is soft and difficult to obtain free from the whey. When the former happens to be the case, a portion of the first whey that separates may be taken out into another vessel, allowed to cool, and then poured in again. If it prove to have been too cool, hot milk or water may be added to it; or a vessel containing hot water may be put into it before the curdling commences; or the first portion of the whey that separates, may be heated and poured again upon the curd. The quality of the cheese, however, will always be more or less affected, when it happens to be necessary to adopt any of these remedies. To make the best cheese, the true temperature should always be attained, as nearly as possible, before the rennet is added.

If, as is the case in many family dairies, the milk be warmed in brass caldrons, great care must be taken that it is not singed or fire-fanged. A very slight inattention may cause this to be the case, and the taste of the cheese is sure to be more or less affected by it. It is desirable in this heating not to raise the temperature higher than is necessary, as a great heat is apt to give an oiliness to the fatty matter of the milk.

The time during which the curd stands is also of importance. It should be broken up as soon as the milk is fully coagulated. The longer it stands after this, the harder and tougher it will become.

The quality of the rennet is of much importance, not only in regard to the certainty of the coagulation, but also to the flavor of the cheese. The quantity of rennet added ought to be regulated as carefully as the temperature of the milk. Too much renders the curd tough; too little causes the loss of much time, and may permit a larger portion of the butter to separate itself from the curd. It is to be expected, also, that when rennet is used in great excess, a portion of it will remain in the curd, and will naturally affect the kind and rapidity of the changes it afterwards undergoes. Thus it is said to cause the cheese to heave or swell out from fermentation. It is probable, also, that it will affect the flavor which the cheese acquires by keeping. Thus it may be that the agreeable or unpleasant taste of the cheeses of certain districts or dairies may be less due to the quality of the pastures, or of the milk itself, than to the quantity of rennet with which it has there been customary to coagulate the milk.

Treatment of the Curd.—It is usual in our best cheese districts carefully and slowly to separate the curd from the whey; not to hasten the separation, lest a larger portion of the fatty matter should be squeezed out of the curd, and the cheese should thus be rendered poorer than usual. But, in some places, the practice prevails of washing the curd with hot water after the whey has been partially separated from it. The separation of the whey is part of the process upon which the qualities of the cheese in a considerable degree depends. In making the celebrated Stilton cheese, the curd is not cut or broken at all, but is pressed gently and with care till the whey gradually

drains out. Thus the butter and the curd remain intermixed, and the rich cheese of Stilton is the result. Thus, while it is of importance that all the whey should be extracted from the curd, yet the quickest way may not be the best. More time and care must be bestowed in order to effect this object, the richer the cheese we wish to obtain. The quality of the milk or of the pastures may often be blamed for the deficiencies in the richness or other qualities of cheese, which are in reality due to slight but material differences of manufacturing it. The salt used should be of the purest quality.

How the Salt is Applied.—In making large cheeses, the dried curd, for a single cheese of sixty pounds, is broken down fine, and divided into three equal portions. One of these is mingled with double the quantity of salt added to the others, and this is so put into the cheese vat, as to form the central part of the cheese. By this precaution, the after-salting on the surface is sure to penetrate deep enough to cure effectually the less salted parts. It may not be impossible to cause salt to penetrate into the very heart of a large cheese, but it cannot be easy in this way to salt the whole cheese equally, while the care and attetinon required must be greatly increased. Another mode of improving the quality of cheese is by the addition of cream to the dry and crumbled curd. Much diligence, however, is required fully to incorporate these, so that the cheese may be uniform throughout. Still this practice gives a peculiar character to the cheese so manipulated.

Size of the Cheese.—From the same milk it is obvious that cheeses of different sizes, if treated in the same way, will, at the end of a given number of months, possess qualities in a considerable degree different. Hence, without supposing any inferiority, either in the milk or in the general mode of treatment, the size usually adopted for the cheeses of a particular district or dairy, may be the cause of a recognized inferiority in some quality which it is desirable that they should possess in a high degree.

Curing.—This has very much influence upon the after qualities of the cheese. The care with which they were salted, the warmth of the place in which they are kept during the first two or three weeks, the temperature and closeness of the cheese

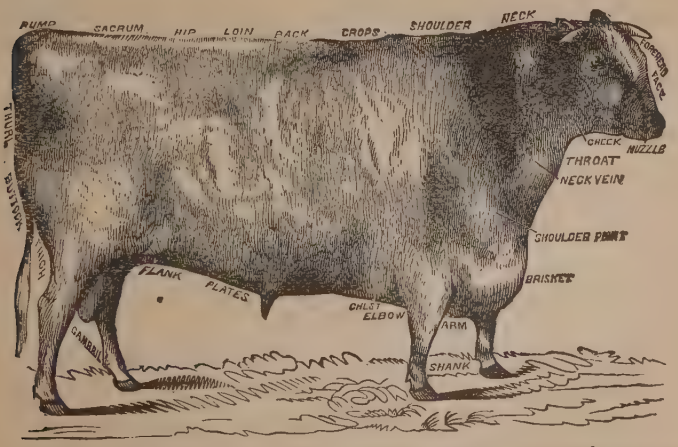
room in which they are afterwards preserved, the frequency of turning, of cleaning from mold, and rubbing with butter; all these circumstances exercise a remarkable influence upon the after qualities of the cheese. Indeed, in very many instances, the high reputation of a particular dairy district, or dairy farm, is derived from some special attention to one or another, or to all of the apparently minor items of its process.

In the foregoing remarks, we have treated the making of cheese in a domestic way chiefly, as a household production. But the manufacture of cheese in our dairy districts has of late assumed such large proportions, being now mainly made in factories, that the old time manner of treating it, in all but the preparation of the essential ingredients, is thrown aside for more recent improvements, as the heating caldron, the curd vats, and various other utensils to work the milk through its different processes into the perfectly cured cheese. It has become a trade by itself, requiring skill, experience, and apprenticeship to the work, which few can obtain outside of the regular factory.

Fattening Cattle for Market.—The stall-feeding or soiling of cattle is considered to possess several advantages over feeding in the fields. In field-feeding the animals waste a certain quantity of pasture by treading and lying upon it, and dropping their dung—the grass which grows on the dung spots being ever after rejected; the animals also spend time in seeking for the herbage which suits their fancy, and much is allowed to go to seed untouched. In stall-feeding the whole time is devoted to eating and ruminating, while no food is lost, and the animals are brought to a higher condition. Another important advantage of soiling is that it uses up the waste straw of a farm as litter, and thus furnishes a plentiful supply of that indispensable article, manure, for the fields. Some feeders tie up their cattle to the stall while preparing for market; but others permit them to roam about on a thick bed of straw in an enclosure in the farm yard, with a shed to retire to for shelter—the feeding in this case being from racks. Unless for a period during the final process of fattening, the straw-yard method is reckoned the best for keeping the cattle in a healthy state, and consequently for producing beef of the finest kind.

The practice of feeding cattle, for a considerable length of time, in darkened stalls, on oil-cake, carrots, mangle-wurzel, &c., produces, as is well known, a great deposition of fat, and swells the animal to a monstrous size. The beef, however, of such over-fed cattle is never fine. The fat with which it is loaded easily escapes in cooking, and leaves lean of an inferior quality. The best sign of good meat is its being marbled, or the fat and lean well mixed, when brought to the table; and this is not to be expected from beef fed in an unnatural condition.

The age at which cattle are fattened depends upon the manner in which they have been reared—upon the properties of the breed in regard to a propensity to fatten earlier or later in life—and on the circumstances of their being employed in breeding, in labor, for the dairy, or reared solely for the butcher. In the latter case, the most improved breeds are fit for the shambles when about three years old, and very few of any large breed are kept more than a year longer. As to cows and working oxen, the age of fattening must necessarily be more indefinite; in most instances the latter are put up to feed after working three years, or in the seventh or eight year of their age.



Points of Fat Cattle.—Whatever theoretical objections may be raised against over-fed cattle, and great as may be the attempts to disparage the mountains of fat—as highly fed cat-

tle are designated—there is no doubt of the practical fact, that the best butcher cannot sell anything but the best fatted beef; and, of whatever age, size or shape a half fatted ox may be, he is never selected by judges as fit for human food. Hence, a well-fatted animal always commands a better price per pound than one imperfectly fed, and the parts selected as the primest beef are precisely the parts which contain the largest deposits of fat. The rump, the crop, and the sirloin, the very favorite cuts, which always command from twenty to twenty-five per cent. more than any other part of the ox, are just those parts on which the largest quantities of fat are found; so that, instead of the taste and fashion of the age being against the excessive fattening of animals, the fact is, practically, exactly the reverse. Where there is the most fat, there is the best lean; where there is the greatest amount of muscle, without its share of fat, that part is counted inferior, and is used for a different purpose; in fact, so far from fat's being a disease, it is a condition of muscle, necessary to its utility as food, a source of luxury to the rich, and of comfort to the poor, furnishing a nourishing and healthy diet for their families.

Now, there are several qualities which are essentially characteristic of a disposition to fatten. There have not, as yet, been any book rules laid down, but there are, nevertheless, marks so definite and well understood, that they are comprehended and acted upon by every grazier, although they are by no means easy to describe. It is by skillful acumen that the grazier acquires his knowledge, and not by theoretical rules; observation, judgment, and experience, powerful perceptive faculties, and a keen and minute comparison and discrimination, are essential to his success.

The first indication upon which he relies is the touch. It is the absolute criterion of quality, which is supposed to be the keystone of perfection in all animals, whether for the pail or the butcher. The skin is so intimately connected with the internal organs, in all animals, that it is questionable whether even our schools of medicine might not make more use of it in a diagnosis of disease. Of physiological tendencies in cattle, however, it is of the last and most vital importance. It must neither be thick nor hard, nor adhere firmly to the

muscles. If it is so, the animal is a hard grazer, a difficult and obstinate feeder—no skillful man will purchase it—such a creature must go to a novice, and even to him at a price so low as to tempt him to become a purchaser. On the other hand, the skin must not be thin, like paper, nor flaccid, nor loose in the hand, nor flabby. This is the opposite extreme, and is indicative of delicateness, bad, flabby flesh, and, possibly, of inaptitude to retain the fat. It must be elastic and velvety, soft and pliable, presenting to the touch a gentle resistance but so delicate as to give pleasure to the sensitive hand—a skin, in short, which seems at first to give an indentation from the pressure of the fingers, but which again rises to its place by a gentle elasticity.

The hair is of nearly as much importance as the skin. A hard skin will have straight and stiff hair; it will not have a curl, but be thinly and lankly distributed equally over the surface. A proper grazing animal will have a mossy coat, not absolutely curled, but having a disposition to a graceful curl, a semifold, which presents a waving inequality, but as different from a close and straight laid coat, as it is from one standing off the animal at right angles, a strong symptom of disease. It will also, in a thriving animal, be licked here and there with its tongue, a proof that the skin is duly performing its functions.

There must be, also the full and goggle eye, bright and pressed outward by the fatty bed below; because, as this is a part where nature always provides fat, an animal capable of developing it to any considerable extent, will have its indications here, at least, when it exists in excess.

So much for feeding qualities in the animal, and their conformations indicative of this kindly disposition. Next come such formations of the animal itself as are favorable to the growth of fat, other things being equal. There must be size where large weights are expected. Christmas beef, for instance, is expected to be large as well as fat. The symbol of festivity should be capacious, as well as prime in quality. But it is so much a matter of choice and circumstance with the grazier, that profit alone will not be his guide. The axiom will be, however, as a general rule, that the better the grazing soil the larger

the animal may be; the poorer the soil, the smaller the animal. Small animals are, unquestionably, much more easily fed, and they are well known by experienced men to be best adapted to second-rate feeding pastures.

But, beyond this, there must be breadth of carcass. This is indicative of fattening, perhaps, beyond all other qualifications. If rumps are favorite joints, and produce the best price, it is best to have the animal which will grow the longest, the broadest, and the best rump; the same of crop, and the same of sirloin; and, not only so, but breadth is essential to the consumption of that quantity of food which is necessary to the development of a large amount of fat in the animal. Thus, a deep, wide chest, favorable for the respiratory and circulating functions, enables it to consume a large amount of food, to take up the sugary matter and to deposit the fatty matter—as then useless for respiration, but afterwards to be prized. A full level crop will be of the same physiological utility; while a broad and open framework at the hips will afford scope for the action of the liver and kidneys.

There are other points, also, of much importance; the head must be small and fine; its special use is indicative of the quick fattening of the animal so constructed, and it is also indicative of the bones being small and the legs short. For constitutional powers, the beast should have his ribs extended well toward the thigh-bones or hips, so as to leave as little unprotected space as possible. There must be no angular or abrupt points; all must be round, and broad, and parallel. Any depression in the lean animal will give a sufficient deposit of flesh and fat at that point, when sold to the butcher, and thus deteriorate its value; and hence the animal must be round and full.

But either fancy, or accident, or skill—it is unnecessary to decide which—has associated symmetry with quality and conformation, as a point of great importance in animals calculated for fattening; and there is no doubt that, to a certain extent, that is so. The beast must be a system of mathematical lines. To the advocate of symmetry, the setting-on of a tail will be a condemning fault; indeed the ridge of the back, like a straight line, with the outline of the belly exactly parallel, viewed from the side, and a depth and squareness when viewed

from behind—which remind us of a geometrical cube, rather than a vital economy—may be said to be the indications of excellence in a fat ox. The points of excellence in such an animal are outlined under the subsequent head, as developed in the cutting up after slaughter.

Now, those qualities are inherent in some breeds; there may be cases and instances in all the superior breeds, and in most there may be failures.

Slaughtering.—Cattle are made to fast before slaughter. The time they should stand depends upon their state on their arrival at the shambles. If they have been driven a considerable distance in a proper manner, the bowels will be in a pretty empty state, so that twelve hours may suffice; but if they are full and just off their food, twenty-four hours will be required. Beasts that have been overdriven, or much struck with sticks, or in any degree infuriated, should not be immediately slaughtered, but allowed to stand on dry food, such as hay, until the symptoms disappear. These precautions are absolutely necessary that the meat may be preserved in the best state.

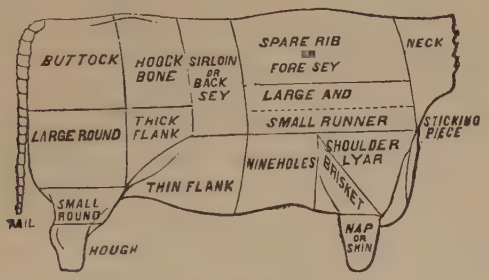
The mode of slaughtering cattle varies in different countries. In the great slaughter-houses at Montmartre, in Paris, they are slaughtered by bisecting the spinal cord of the cerical verterbæ; and this is accomplished by the driving of a sharp-pointed chisel between the second and third vertebræ, with a smart stroke of a mallet while the animal is standing, when it drops, and death or insensibility instantly ensues, and the blood is let out immediately by opening the blood-vessels of the neck. The plan adopted in England is, first to bring the ox down on his knees and place his under jaw upon the ground by means of ropes fastened to his head and passed through an iron ring in the floor of the slaughter house. He is then stunned by a few blows from an iron axe made for the purpose, on the forehead, the bone of which is usually driven into the brain. The animal then falls upon his side, and the blood is let out by the neck. Of the two modes, the French is apparently the less cruel, for some oxen require many blows to make them fall. Some butchers, however, allege that the separation of the spinal cord, by producing a general nervous convulsion throughout the body, prevents the blood from flowing as

rapidly and entirely out of it as when the ox is stunned in the forehead. The skin is then taken off to the knees, when the legs are disjointed, and also off the head. The carcass is then hung up by the tendons of the hough on a stretcher, by a block and tackle, worked by a small winch, which retains in place what rope it winds up by means of a wheel and rachet.

After the carcass has hung for twenty-four hours, it should be cut down by the back-bone or chine into two sides. This is done either with the saw or chopper; the saw making the neater job in the hands of an inexperienced butcher, though it is the more laborious; and with the chopper is the quicker, but by no means the neater, plan, especially in the hands of a careless workman. In London, the chine is equally divided between both sides; while in Scotland one side of a carcass of beef has a great deal more bone than the other, all the spinous processes of the vertebræ being left upon it. The bony is called the lying side of the meat. In London, the divided processes in the fore-quarters are broken in the middle when warm, and chopped back with the flat side of the chopper, which has the effect of thickening the fore and middle ribs considerably when cut up. The London butcher also cuts the joints above the hind knee, and, by making some incisions with a sharp knife, cuts the tendons there, and drops the flesh of the hind-quarters on the flank and loins, which causes it to cut up thicker than in the Scotch mode. In opening the hind-quarter he also cuts the aitch bone or pelvis through the centre, which makes the rump look better. Some butchers in the north of England score the fat of the closing of the hind-quarter, which has the effect of making that part of both heifer and ox look like the udder of an old cow. There is far too much of this scoring practiced in Scotland, which prevents the pieces from retaining—which they should, as nearly as possible—their natural appearance.

Cutting Up.—In cutting up a carcass of beef the London butcher displays great expertness; he not only discriminates between the qualities of the different parts, but can cut out any piece to gratify the taste of his customers. In this way he makes the best use of the carcass and realizes the largest value for it, while he gratifies the taste of every grade of customers.

A figure of the Scotch and English modes of cutting up a carcass of beef will at once show the difference; and, upon being informed where the valuable pieces lie, an opinion can be formed as to whether the oxen the farmer is breeding or feeding possess the properties which will enable him to demand the highest price for them:

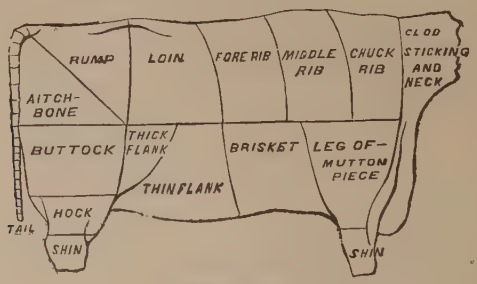


SCOTCH MODE.

The sirloin is the principal roasting-piece, making a very handsome dish, and is a universal favorite. It consists of two portions, the Scotch and English sides; the former is above the lumbar bones, and is somewhat hard in ill-fed cattle; the latter consists of the muscles under these bones, which are generally covered with fine fat, and are exceedingly tender. The better the beast is fed, the larger is the under muscle, better covered with fat and more tender to eat. The hook-bone and the buttocks are cut up for steaks, beef-steak-pie, or minced collops, and both these, together with the sirloin, bring the highest price. The large round and the small round are both well known as excellent pieces for salting and boiling, and are eaten cold with great relish. The hough is peculiarly suited for boiling down for soup, having a large proportion of gelatinous matter. Brown soup is the principal dish made of the hough, but its decoction forms an excellent stock for various dishes, and will keep in a state of jelly for a considerable time. The thick and the thin flank are both admirable pieces for salting and boiling. The tail, insignificant as it may seem, makes a soup of a very fine flavor. Hotel keepers have a trick of seasoning brown soup, or, rather, beef-tea, with a few joints of tail, and passing it off for genuine ox-tail soup. These are all the pieces which constitute the hind-quarter; and it will be

seen that they are valuable both for roasting and boiling, not containing a single coarse piece

In the fore-quarter is the spare-rib, the six ribs of the back end of which make an excellent roast, and, when taken from the side opposite the lying one, being free of the bones of the spine, it makes a larger one; and it also makes excellent beef-steaks and beefsteak-pie. The two runners and the nineholes make excellent salting and boiling pieces, but of these, the nineholes is much the best, as it consists of layers of fat and lean without any bone; whereas the foreparts of the runners have a piece of shoulder-blade in them, and every piece connected with that bone is more or less coarse-grained. The brisket eats very well boiled fresh in broth, and may be cooked and eaten with boiled greens or carrots. The shoulder-lyar is a coarse piece, and fit only for boiling fresh to make into broth or beef-tea. The nap, or shin, is analogous to the hough of the hind leg, but not so rich and fine, there being much less gelatinous matter in it. The neck makes good broth; and the sticking-piece is a great favorite with some epicures, on account of the rich pieces of fat in it. It makes an excellent stew, as also sweet barley-broth, and the meat eats well when broiled in it.



ENGLISH MODE.

These are all the pieces of the fore-quarter; and it will be seen that they consist chiefly of boiling-pieces, and some of them none of the finest—the roasting-piece being confined to the six ribs of the spare rib, and the finest boiling piece, corned, only to be found in the nineholes.

The loin is the principal roasting-piece; the rump is the favorite steak-piece; the aitch-bone, the favorite stew; the

buttock, the thick flank, and the thin flank are all excellent boiling-pieces when corned; the hock and the shin make soup and afford stock for the various requirements of the culinary art; and the tail furnishes ox-tail soup—a favorite English luncheon. These are all the pieces of the hind-quarter, and they are valuable of their respective kinds

In the fore-quarter, the fore-rib, middle-rib, and chuckle-rib, are all roasting pieces, not alike good; but in removing the part of the shoulder-blade, in the middle-rib, the spare-ribs below make a good broil or roast; the neck makes soup, being used fresh, boiled; the back end of the brisket is boiled, corned or stewed; the leg-of-mutton piece is coarse, but is as frequently stewed as boiled; the shin is put to the same use as the shin and hock of the hind-quarter.

On comparing the two modes of cutting-up, it will be observed that in the English there are more roasting-pieces than in the Scotch, a large proportion of the fore-quarter being used in that way. The plan, too, of cutting the loin between the rump and aitch-bone in the hind-quarter, lays open the steak-pieces to better advantage than in the Scotch bullock. Extending the comparison from one part of the carcass to the other, in both methods, it will be seen that the most valuable pieces—the roasting—occupy its upper, and the less valuable—the boiling—its lower part. Every beast, therefore, that lays on beef more upon the upper part of its body is more valuable than one that lays the same quantity of flesh on its lower parts.

It is deemed unnecessary to enter into details as to the modes of cutting-up most in vogue in this country, as there is a needlessly great want of uniformity.

Beef.—Beef is the staple animal food of this country, and it is used in various states—fresh, salted, smoked, roasted, and boiled. When intended to be eaten fresh, the ribs will keep the best, and with care will keep five or six days in summer, and in winter ten days. The middle of the loin is the next best, and the rump the next. The round will not keep long, unless it is salted. The brisket is the worst, and will not keep more than three days in summer, and in winter a week. In regard to the powers of the stomach to digest beef, that which is eaten boiled with salt only, is digested in two hours and forty-

five minutes. Beef, fresh, lean, and rarely roasted, and a beef-steak broiled, takes three hours to digest; that fresh, and dry-roasted, and boiled, eaten with mustard, is digested in three and a half hours. Lean fresh beef fried, requires four hours, and old, hard salted beef boiled, does not digest in less than four and a quarter hours. Fresh beef-suet boiled, takes five and a half hours.

Its Preservation.—The usual mode of preserving beef is by salting; and, when intended to keep for a long time, such as for the use of shipping, it is always salted with brine; but for family use it should be salted only with good salt, for brine dispels the juice of meat, and saltpetre only serves to make the meat dry, and give it a disagreeable and unnatural red color. Various experiments have been made in curing beef with salt otherwise than by hand-rubbing, and in a short space of time; and also to preserve it from putrefacation by other means than salt. Some packers put meal in a copper which is rendered air-tight, and an air-pump then creates a vacuum within it, thereby extracting all the air out of the meat; then brine is pumped in by pressure, which, entering into every pore of the meat formerly occupied by the air, is said to place it in a state of preservation in a few minutes.

The Offal.—Cattle, when slaughtered, are useful to man in various other ways than by affording food from their flesh—their offal of tallow, hides, and horns, forming extensive articles of commerce. Of the hide, the characteristics of a good one for strong purposes, are strength in its middle, or butt, as it is called, and lightness in the edges or offal. A bad hide is the opposite of this—thick in the edges and thin in the middle. A good hide has a firm texture; a bad one, loose and soft. A hide improves as the summer advances, and it continues to improve after the new coat of hair in autumn until November or December, when the coat gets rough from the coldness of the season, and the hide is then in its best state. It is surprising how a hide improves in thickness after the cold weather has set in. The sort of food does not seem to affect the quality of the hide; but the better it is, and the better cattle have been fed, and the longer they have been well fed, even from a calf, the better the hide. From what has been said of the effect of weather

upon the hide, it seems a natural conclusion that a hide is better from an ox that has been fed in the open air than from one that has been kept in the barn. Dirt adhering to a hide injures it, particularly in stall-fed animals; and any thing that punctures a hide, such as warbles arising from certain insects, is also injurious. The best hides are obtained from the West Highlanders. The Short Horns produce the thinnest hides, the Aberdeenshire the next, and then the Angus. Of the same breed, the ox affords the strongest hide; but, as hides are applied to various uses, the cow's, provided it be large, may be as valuable as that of the ox. The bull's hide is the least valuable. Hides are imported from Russia and South America.

Leather.—Hides, when deprived of their hair, are converted into leather by an infusion of the astringent property of bark. The old plan of tanning used to occupy a long time; but, such was the value of the process, that the old tanners used to pride themselves upon producing a substantial article—which is more than can be said in many instances under modern improved modes, which hasten the process, much to the injury of the article produced. Strong infusions of bark make leather brittle; one hundred pounds of skin, quickly tanned in a strong infusion, produce one hundred and thirty-seven pounds of leather, while a weak infusion produces only one hundred and seventeen and a half, the additional nineteen and a half pounds serving only to deteriorate the leather, and causing it to contain much less textile animal solid. Leather thus highly charged with tanning is so spongy as to allow moisture to pass readily through its pores, to the great discomfort and injury of those who wear shoes made of it. The proper mode of tanning lasts a year, or a year and a half, according to the quality of the leather wanted and .the nature of the hides. A perfect leather can be recognized by its section, which should have a glistening marble appearance, without any white streaks in the middle. The hair which is taken off hides in tanning, is employed to mix with plaster, and is often surreptitiously put into hair-mattresses.

Method of Ascertaining the Weight of Cattle While Living.—This is of the utmost utility for all those who are not experienced judges by the eye; and, by the following directions,

the weight can be ascertained within a mere trifle: Take a string, put it round the beast, standing square, just behind the shoulder-blade; measure on a foot-rule the feet and inches the animal is in circumference—this is called the girth; then, with the string, measure from the bone of the tail which plumbs the line with the hinder part of the buttock; direct the line along the back to the fore part of the shoulder-blade; take the dimensions on the foot rule as before, which is the length, and work the figures in the following manner: Girth of the bullock, 6 feet, 4 inches; length, 5 feet, 3 inches; which, multiplied together, make 31 square superficial feet; that again multiplied by 23 (the number of pounds allowed to each superficial foot of cattle measuring less than 7 and more than 5 in girth), makes 713 pounds; and, allowing 14 pounds to the stone, is 50 stone, 13 pounds. Where the animal measures less than 9 and more than 7 feet in girth, 31 is the number of pounds to each superficial foot. Again, suppose a pig, or any small beast, should measure 2 feet in girth, and 2 feet along the back, which, multiplied together, make 4 square feet; that, multiplied by 11 (the number of pounds allowed for each square foot of cattle measuring less than 3 feet in girth), makes 44 pounds; which, divided by 14, to bring it to stones, is 3 stone, 2 pounds. Again, suppose a calf, a sheep, &c., should measure 4 feet 6 inches in girth, and 3 feet 9 inches in length, which, multiplied together, make 16 1-2 square feet; that multiplied by 16 (the number of pounds allowed to all cattle measuring less than 5 feet, and more than 3, in girth), makes 264 pounds; which, divided by 14, to bring it into stones, is 18 stone 12 pounds. The dimensions of the girth and length of black cattle, sheep, calves, or hogs, may be as exactly taken this way, as is at all necessary for any computation or valuation of stock, and will answer exactly to the four quarters, sinking the offal; and which every man, who can get even a bit of chalk, can easily perform. A deduction must be made for a half-fatted beast, of 1 stone in 20, from that of a fat one; and, for a cow that has had calves, 1 stone must be allowed, and another for not being properly fat.

Breaking Steers.—This should be commenced when two or three years old. Some begin with the calf, accustoming him to a light yoke and occasional training. This practice will do as

a pastime for trustworthy boys, as it makes them gentle and manageable afterwards, but is hardly worth a man's time. If always carefully handled when young, they will be found tractable.

They should at first be placed behind a pair of well-broke cattle, nor should they be put to hard labor until quite grown, strong, and perfectly accustomed to the yoke. If properly managed, cattle may be trained with all the docility, intelligence, and much of the activity of the horse. That they are not, is more frequently the fault of their masters.

Management of Oxen.—To procure perfect working cattle, it is necessary to begin with the proper breed. Many parts of the country furnish such as are well suited to this purpose. A strong dash of Devon or Hereford blood is desirable, when it needs to be improved. A well-formed, compact, muscular body; clean, sinewy limbs; strong, dense bones; large, well-formed joints, with a mild, expressive eye, are essential for good working oxen.

After breaking, they must be led along gently, and taught before they are required to perform their task; and never put to a load which they cannot readily move, nor dulled by prolonging exertion beyond that period when it becomes irksome. A generous diet is necessary, to keep up the spirit and ability of cattle, when there is hard work to be done. The horse and mule are fed with their daily rations of grain, when at hard service, and, if the spirit of the ox is to be maintained, he should be equally well fed, when as fully employed. Great and permanent injury is the result of niggardly feeding and severe toil, exacted from the uncomplaining animal. His strength declines, his spirit flags, and, if this treatment be continued, he rapidly becomes the stupid, moping brute, which is shown off in degrading contrast with the more spirited horse, that performs, it may be, one-half the labor on twice his rations.

The ox should be as little abused by threats and whipping, as by stinted feed and overtasked labor. Loud and repeated hallooing, or the severe use of the lash, is as impolitic as it is cruel and disgraceful. We never witness this barbarity without wishing the brutes could change places, long enough at least to teach the biped that humanity by his own sufferings

which his reason and sensibility have failed to inspire. Clear and intelligent, yet low and gentle words, are all that are necessary to guide the well-trained, spirited ox. The stick, or whip, is needed rather to indicate the precise movement desired, than as a stimulant or means of punishment. The ox understands a moderate tone more perfectly than a boisterous one, for all sounds become indistinct as they increase.

It is of great advantage to have oxen well trained to backing. They may soon be taught, by beginning with an empty cart on a descent; then on a level; then with an increasing load, or uphill, till the cattle will back nearly the same load they will draw.

Some oxen have a bad trick of hauling or crowding. Changing to opposite sides, longer or shorter yokes, and, more than all, gentle treatment, are the only remedies, and those not unfrequently fail. Cattle will seldom contract this habit in the hands of a judicious, careful driver. The yokes should be carefully made and set easy, and the bows fitted to the necks and properly attached to the yoke. Cattle are liable to sore necks if used in a storm; and, when subject to this exposure, they must be well rubbed with grease, where the yoke chafes them, and respite from work should be allowed till the necks heal.

Spaying.—The following description of the operation of spaying cows, its effects and advantages, is by the celebrated French veterinary surgeon, M. Morin:

Young cows ought to receive that nourishment which favors the secretion of milk, and which in consequence renders active their lactiferous vessels. The cow is not usually in full production until after the third or fourth calf; she continues to give the same return up to the seventh or eight; from this time lactation diminishes after each new calving. On the other hand, from the moment that the cow has received the bull, and gradually as gestation advances, the quantity of milk progressively diminishes in most breeds, until three or four months before healthy parturition, the secretion of milk is almost nothing. It is to guard against this loss, and other inconvenience, that we lay down what we have obtained after some years' experience in spaying the cow, and the happy results that we meet with daily

ADVANTAGES OF THIS OPERATION.—"The operation of spaying in the cow is productive of great advantages.

"1. The cow spayed a short time after calving, that is to say, thirty or forty days afterward, and at the time when she gives the largest quantity of milk, continues to give the like quantity, if not during her whole lifetime, at least during many years, and at the time when the milk begins to dry up the animal fattens. We are able to add, moreover, at this day, certain facts, the result of many years' experiment, that the milk of the spayed cow, although as abundant, and sometimes more so, than before the operation, is of a superior quality to that from a cow not spayed; that it is uniform in its character, that it is richer, consequently more buttery, and that the butter is always of a golden color.

"We belive that we ought to remark in passing, that if we feed the spayed cow too abundantly, lactation diminishes, and that the beast promptly fattens. It is therefore important that the feeding should not be more than sufficient to enable us to obtain the desired result.

"2. The spayed cow fattens more easily; its flesh, age considered, is better than that of the ox; it is more tender and more juicy.

"Indeed, no one is ignorant of the fact that all domestic animals, females as well as males, deprived of their procreative organs, fatten more quickly than those which retain them; that the flesh of the spayed females is more tender and more delicate than that of males. The same phenomena take place among spayed cows that occur among other females that have submitted to this operation; so, besides the advantage of furnishing a long continued supply, before commencing a course of fattening, of abundant milk, and butter of a superior quality, the cow fattens easily and completely, and a certain benefit follows this course.

"3. In spaying decrepit cows, that is to say of the age of from six to seven years, puny, small ones; those which, though fine in appearance, bear badly; those which are subject to miscarriage; those which frequently experience difficult calving or delivery; those difficult to keep; and, finally, all those that are taurelieres, that is to say, constantly in heat—we have in addi-

tion to an abundant production of milk and butter, and a facility of fattening, the advantage of preventing a degeneration of the species, and, moreover, of avoiding a crowd of accidents or maladies, which frequently take place during or after gestation, and of diminishing those which happen during the period of heat, such as that of heavy cows mounting others or being jumped upon by too heavy bulls.

"Except under peculiar circumstances, we should take care in spaying the cow, that its teats have acquired their complete development, and that the milk has the proper qualities. The most suitable time is after the third or fourth calving.

"Many societies of agriculture, impressed with the important results that this operation effects, fix yearly at their agricultural meetings, premiums for the encouragement of the spaying of old cows. We doubt not that other societies who have not yet adopted this plan—not being convinced of its importance—when they are, will imitate their example. By this means they bestow upon the country a new source of products.

"We have been engaged for four years in researches upon this valuable discovery; we believe that it is incumbent upon us to state the results that we have obtained up to the present time. In the number of twenty-seven cows, aged from six to fifteen years, that we have actually spayed, we have had the following results: 1. Increase of milk in cows of six years; 2. Constant production in those that have passed that age; 3. Milk richer than that of the cow not spayed, consequently more buttery, and the butter both of a uniformly golden color, and having an aroma and taste far superior that of a cow that has not undergone this operation.

"In July we obtained as a subject of experiment, a cow from Brittany, of the small kind, twelve years old, calved about two months before, and which gave, when we obtained her, about six quarts of milk daily. The next day after we performed the operation of spaying, indeed the first eight days after that, the secretion of milk sensibly diminished, in consequence of the light diet on which she had been put; but, on the ninth day, the time at which the cure was complete and the cow put on her ordinary food, the milk promptly returned as to its former quantity, and she at the same time assumed a

plumpness that she had not had previously. Customarily bringing together, the yield of three days butter-making being eighteen quarts, it produced constantly two kilograms of butter of the best quality. From the month of December to the following March, the quantity of milk diminished about one-third, and the butter proportionately, the cow during that time having been put on dry fodder. But so soon as we were able to turn her into pasture—about the beginning of April—the milk, after eight days of this new food, resumed its former course, and the animal continued daily to furnish the same relative amounts of milk and butter as before.

"Three cows, two of which were fourteen years old, and the other fifteen, have dried up two years after the operation, and at the same time promptly fattened, without increase or change of food.

"One cow, eight years old, plentifully supplied with trefoil and cabbage, gave, a short time after the operation, a quantity of milk nearly double that which she gave before, although she was kept on the same kind of food. She has during a year continued to furnish the same amount, and has in addition fattened so rapidly that the owner has been obliged, seeing her fatness, to sell her to the butcher, although she was still very good for milk.

"Another fact, no less worthy of remark, we must not pass over in silence, and which goes to prove the superior and unchanging quality of the milk of a spayed cow. It is, that a proprietor having spayed a cow five years old, recently calved, with the special intention of feeding with her milk a newly-born infant, the infant arriving at the age of six months, of a robust constitution, refused its pap since it had been accidentally prepared with milk different from that of the spayed cow.

"The other cows which had been spayed continued to give entire satisfaction to their owners, as well in respect to the quantity and quality of the milk, as also by their good condition.

"Six cows manifested, shortly after the operation, and on divers occasions, the desire for copulation; but we have not remarked this peculiarity except among the younger ones. In other respects, the milk has not indicated the least alteration in quantity or quality.

'Indeed, the happy results that are daily attained from this important discovery are so conclusive and so well known at this time in our part of the country, that as we write, many proprietors bring us constantly good milch cows, since we have called upon them to do so, for us to practice the operation of spaying upon them. Every owner of cattle is aware that, from the time that the cow has received a bull, and in proportion as gestation advances, the milk changes and diminishes progressively, until at last, two or three months before a healthy parturition, the animal gives very little or no milk, whence ensues considerable loss; while, at the same time, after the cows are subjected to the bull, the milk and butter are—for fifty days, at least—of a bad quality, and improper to be exposed for sale; but, in addition to this, breeding cows are generally subjected to such loss in winter, and their keepers find themselves, during a great part of the year, entirely deprived of milk and butter, and at a time, too, when they most need them.

"By causing the cows to undergo this operation, the owner will never fail of having milk and butter of excellent quality; fatten his animals easily when they dry up, and also will improve the race, an anxiety which is perceived in many provinces in France.

"In general, the means employed by farmers to obtain the best possible price for old cows, beyond being useful, or, to use a commercial term, not merchantable, as to bring them to the bull, intending that gestation shall give them more suitable plumpness, so that they may be sold on more advantageous terms to the butcher; but does this state of fictitious embonpoint, or fatness, render the flesh of these beasts better? Assuredly not. It is merely bloated, flabby flesh, livid, and which easily taints. Broth made from it is not rich, is without flavor, and without an agreeable smell; the lean and fat are in a measure infiltrated with water, and are consequently of bad quality and difficult sale. These causes ought, then, to determine farmers to adopt the advice we give; they, as well as the butcher and the consumer, will derive very great advantage from it.

The Operation.—"Having covered the eyes of the cow to be operated upon, we place her against a wall provided

with five rings, firmly fastened and placed as follows: The first corresponds to the top of the withers; the second to the lower anterior part of the breast; the third is placed a little distance from the angle of the shoulder; the fourth is opposite to the anterior and superior part of the lower region; and the fifth, which is behind, answers to the under part of the buttocks. We place a strong assistant between the wall and the head of the animal, who firmly holds the left horn in his left hand, and with his right, the muzzle, which he elevates a little. This done, we pass through and fasten the end of a long and strong plaited cord in the ring, which corresponds to the lower part of the breast; we bring the free end of the cord along the left flank, and pass it through the ring which is below and in front of the withers. We bring it down along the breast behind the shoulders and the angle of the fore leg to pass it through the third ring; from there, we pass it through the ring, which is at the top of the back; then it must be passed around against the outer angle of the left hip, and we fasten it, after having drawn it tightly to the posterior ring by a single bow-knot.

"The cow being firmly fixed to the wall, we placed a cord, fastened by a slip-noose around its hocks to keep them together, in such a manner that the animal can not kick the operator, the free end of the cord and the tail are held by an assistant. The cow, thus secured, can not, during the operation, move forward, nor lie down, and the veterinary surgeon has all the ease desirable, and is protected from accident.

M. Levrat advises that an assistant should hold a plank or bar of wood obliquely under the teats and before its limbs to ward off the kicks; but this method is not always without danger, both to the operator and the animal, because, at the commencement, that is, when the surgeon makes the incision through the hide and muscles, the cow makes such sudden movements and tries so frequently to strike with its left hind foot, that it may happen that upon every movement the plank or the bar may be struck against the operator's legs. On the other hand, although the defense may be firmly held by the assistant, yet it may happen that, in spite of his exertions, he sometimes may be thrown against the operator by the movements she may attempt, and there may be an uncontrollable

displacement of the plank or bar; and then it may happen that she becomes wounded, and at the same time prevents the operation, while, by the mode we point out, there is no fear of accident, either to the operator or the beast. In case of the want of a wall provided with rings, we may use a strong palisade, a solid fence, or two trees a suitable distance apart, across which we fix two strong bars of wood, separated from each other, according to the size of the cow

"There is another means of confining them that we have employed for some time past, where the cows were very strong and irritable, more simple than the preceeding, less fatiguing for the animal, less troublesome for the operator, and which answers perfectly. It consists: First. In leaving the cow almost free, covering her eyes, holding her head by two strong assistants, one of whom seizes her nose with his hand and strongly pinches the nostrils whenever the animal makes any violent movements during the operation. Second. To cause another assistant to hold the two hind legs, kept together by means of a cord passed above and beneath the hocks; this assistant also holds the tail, and pulls it whenever the animal seeks to change its place.

"The cow being conveniently disposed, and the instruments and appliances, such as curved scissors upon a table, a convex edge bistoury, a straight one, and one buttoned at the point, suture needle filled with double thread of desired length, pledgets of lint of appropriate size and length, a mass of tow (in pledgets) being collected in a shallow basket, held by an intelligent assistant, we place ourselves opposite to the left flank, our back turned a little toward the head of the animal, we cut off the hair which covers the hide in the middle of the flanks, at an equal distance between the back and the hip, for the space of thirteen or fourteen centimetres in circumference; this done, we take the convex bistoury, and place it opened between our teeth, the edge out, the joint to the left; then, with both hands, we seize the hide in the middle of the flank and form of it a wrinkle of the requisite elevation, and running lengthwise of the body. We then direct an assistant to seize with his right hand the right side of the wrinkle; we then take the bistoury that we held in our teeth and we cut the wrinkle

at one stroke through the middle; the wrinkle having been suffered to go down, a separation of the hide is presented of sufficient length to enable us to introduce the hand; thereupon we separate the edges of the hide with the thumb and forefinger of the left hand, and, in like manner, we cut through the abdominal muscles, the iliax (slightly obliquely) and the lumbar (across) for the distance of a centimetre from the lower extremity of the incision made in the hide; this done, armed with the straight bistoury, we make a puncture of the peritoneum at the upper extremity of the wound; we then introduce the buttoned bistoury, and move it obliquely from above to the lower part, up to the termination of the incision made in the abdominal muscles. The flank being opened, we introduce the right hand into the abdomen and direct it along the right side of the cavity of the pelvis, behind the cul de saurumen (paunch) and underneath the rectum, where we find the cornes de l'uterus (matrix); after we have ascertained the position of these viscera, we search for the ovaires (organs of reproduction), which are at the extremity of the cornes, and when we have found them, we seize them between the thumb and forefinger, detach them completely from the ligaments that keep them in their place, pull lightly, separating the cord, and the vessels (uterine or fallopian tube) at their place of union with the ovarium, by means of the nail of the thumb and forefinger, which presents itself at the point of touch; in fact we break the cord and bring away the ovarium. We then introduce again the hand in the abdominal cavity, and we proceed in the same manner to extract the other ovaria. This operation terminated, we, by the assistance of the needle, place a suture of three or four double threads waxed at an equal distance, and at two centimetres, or a little less from the lips of the wound, passing it through the divided tissues, we move from the left hand with the piece of thread; having reached that point, we fasten with a double knot, we place the seam in the intervals of the thread from the right, and, as we approach the lips of the wound, we fasten by a simple knot, with a bow, being careful not to close too tightly the lower part of the seam, so that the suppuration which may be established in the wound may be able to escape. This opera-

tion effected, we cover up the wound with a pledget of lint kept in its place by three or four threads passed through the stitches, and all is completed, and the cow is then led back to the stable.

"It happens, sometimes, that in cutting the muscles, of which we have before spoken, we cut one or two of the arteries which bleed so much that there is necessity for a ligature before opening the peritoneal sac, because, if this precaution be omitted, blood will escape into the abdomen, and may occasion the most serious consequences.

After the Operation.—"The regimen that we prescribe during the first eight days following the operation, is a light diet, and a soothing, lukewarm draught; if the weather should be cold, we cover the cow with a woollen covering. We must prevent the animal from licking the wound and from rubbing it against other bodies. The third day after the operation, we bathe morning and evening about the wound, with water of mallows lukewarm, and in default of this, we annoint it with a salve of hog's lard, and we administer an emollient glyster during three or four days.

"Eight days after the operation we take away the bandage, the lint, the fastenings and the threads; the wound is at that time completely cicatrized, as we have observed that a reunion takes place almost always by the first intention, as we have only observed suppuration in three cows, and then it was very slight. In this case we must use a slight pressure above the part where the suppuration is established, so as to cause the pus to leave it, and, if it continues more than five or six days, we must supply emollients by alcolized water, or chloridized, especially if it be in summer. We then bring the cow gradually back to her ordinary nourishment.

We have remarked in some cows a swelling of the body a short time after being spayed, a state that we have attributed to the introduction of cold air into the abdomen during the operation; but this derangement has generally ceased within twenty-four hours. If the contrary should occur, we administer one or two sudorific draughts, such as wine, warm cider, or a half glass of brandy, in a quart of warm water, treatment which suffices, in a short time, to re-establish a healthy state of the belly, the animal at the same time being protected by two coverings of wool.

"The operation which we have been describing ought to be performed, as we have said before, thirty to forty days after calving, upon a cow which has had her third or fourth calf, so that we may have a greater abundance of milk. The only precaution to be observed before the operation is that on the preceding evening we should not give so copious a meal as usual, and to operate in the morning before the animal has fed, so that the operator shall not find any obstacle from the primary digestive organs, especially the paunch, which, during its state of ordinary fullness, might prevent operating with facility.

"From what has preceded, it is fixed and irrefutable.—1. That spaying induces permanency of milk, increase of quantity, and improvement of quality; richer, more buttery, superior color, finer taste and flavor. 2. The most suitable age is six years, and after the third or fourth calf. 3. The spayed cow fattens more easily, and furnishes beef of a better quality. 4. Cows that are bad breeders may be kept as good milkers, and the quality of good cattle kept up."

Castration.—The period most commonly selected for this operation is between the first and third months. The nearer it is to the expiration of the first month, the less danger attends the operation.

Some persons prepare the animal by the administration of a dose of physic; but others proceed at once to the operation when it best suits their convenience, or that of the farmer. Care, however, should be taken that the young animal is in perfect health. The mode formerly practiced was simple enough:—a piece of whip-cord was tied as tightly as possible around the scrotum. The supply of blood being thus completely cut off, the bag and its contents soon becomes livid and dead, and were suffered to hang, by some careless operators, until they dropped off, or they were cut off on the second or third day.

It is now, however, the general practice to grasp the scrotum in the hand, between the testicles and the belly, and to make an incision in one side of it, near the bottom, of sufficient depth to penetrate through the inner covering of the testicle, and of sufficient length to admit of its escape. The testicle

immediately bursts from its bag, and is seen hanging by its cord.

The careless or brutal operator now firmly ties a piece of small string around the cord, and, having thus stopped the circulation, cuts through the cord, half an inch below the ligature, and removes the testicle. He, however, who has any feeling for the poor animal on which he is operating, considers that the only use of the ligature is to compress the blood vessels and prevent after-hemorrhage, and, therefore, saves a great deal of unnecessary torture by including them alone in the ligature, and afterwards dividing the rest of the cord. The other testicle is proceeded with in the same way, and the operation is complete. The length of the cord should be so contrived that it will immediately retract or be drawn back into the scrotum, but not higher, while the ends of the string hang out through the wound. In the course of about a week the strings will usually drop off and the wounds will speedily heal. There will rarely be any occasion to make any application to the scrotum, except any fomentation of it, if much swelling should ensue.

A few, whose practice cannot be justified, seize the testicle as soon as it escapes from the bag, and, pulling violently, break the cord and tear it out. It is certain, that when a blood-vessel is thus ruptured, it forcibly contracts, and very little bleeding follows; but, if the cord breaks high up, and retracts into the belly, considerable inflammation has occasionally ensued, and the beast has been lost.

The application of torsion—or the twisting of the arteries by a pair of forceps which will firmly grasp them—has, in a great degree, superseded every other mode of castration, both in the larger and smaller domesticated animals. The spermatic artery is exposed and seized with the forceps, which are then closed by a very simple mechanical contrivance; the vessel is drawn a little out from its surrounding tissue, the forceps are turned around seven or eight times, and the vessel liberated. It will be found to be perfectly closed; a small knot will have formed on its extremity; it will retract into the surrounding surface, and not a drop more of blood will flow from it; the cord may then be divided and the bleeding from any little

vessel arrested in the same way. Neither the application of the hot iron, nor of the wooden clamps, whether with or without caustic, can be necessary in the castration of the calf.

A new instrument was introduced in France, some few years since, for this purpose, called the acraseur—so constructed as to throw a chain over the cord, which is wound up by means of a screw working upon the chain, and at the same time the cord is twisted off. No bleeding follows this method of operating.

The advantages resulting from the use of this instrument over all methods are, that the parts generally heal within a week—the operation is not so painful to the animal—it is less troublesome to the operator—also to the owner of the animal—and, lastly, it is a safer and more scientific operation. Its success in France soon gave it a reputation in England, and it has been introduced into this country, and with the best results.

DISEASES AND REMEDIES.

Abortion.—Symptoms.—The cow is, more than any other animal, subject to abortion or slinking, which takes place at different periods of pregnancy, from half of the usual time to the seventh or almost the eighth month. The symptoms of the approach of abortion, unless the breeder is very much among his stock, are not often perceived; or, if perceived, they are concealed by the person in charge, lest he should be accused of neglect or improper treatment.

The cow is somewhat off her feed—rumination ceases—she is listless and dull—the milk diminishes or dries up—the motions of the fœtus become more feeble, and at length cease altogether—there is a slight degree of enlargement of the belly—there is a little staggering in her walk—when she is down she lies longer than usual, and when she gets up she stands for a longer time motionless.

As the abortion approaches, a yellow or red glairy fluid runs from the vagina (this is a symptom which rarely or never deceives), her breathing becomes laborious and slightly convulsive. The belly has for several days lost its natural rotundity, and has been evidently falling—she begins to moan—the pulse becoms small, wiry, and intermittent. At length labor comes on, and is often attended with much difficulty and danger.

If the abortion has been caused by blows or violence, whether from brutality or the animal's having been teased by other cows in season or by oxen, the symptoms are more intense. The animal suddenly ceases to eat and to ruminate—

is uneasy, paws the ground; rests her head on the manger while she is standing, and on her flank while she is lying down —hemorrhage frequently comes on from the uterus, or when this is not the case the mouth of that organ is spasmodically contracted. The throes come on, are distressingly violent, and continue until the womb is ruptured. If all these circumstances be not observed, still the labor is protracted and dangerous.

Abortion is sometimes singularly frequent in particular districts or on particular farms, appearing to assume an epizootic or epidemic form. This has been accounted for in various ways. Some have imagined it to be contagious. It is, indeed, destructively propagated among the cows, but this is probably to be explained on a different principle from that of contagion. The cow is a considerably imaginative animal and highly irritable during the period of pregnancy. In abortion, the fœtus is often putrid before it is discharged; and the placenta, or afterbirth, rarely or never follows it, but becomes decomposed, and, as it drops away in fragments, emits a peculiar and most noisome smell. This smell seems to be peculiarly annoying to the other cows; they sniff at it and then run bellowing about. Some sympathetic influence is exercised on their uterine organs, and in a few days a greater or less number of those that had pastured together likewise abort. Hence arises the rapidity with which the fœtus is usually taken away and buried deeply, and far from the cows; and hence the more effectual preventive of smearing the parts of the cow with tar or stinking oils in order to conceal or subdue the smell; and hence, too, the inefficacy, as a preventive, of removing her to a far-distant pasture.

The pastures on which the blood or inflammatory fever is most prevalent are those on which the cows oftenest slink their calves. Whatever can become a cause of general excitation and fever, is likely, during pregnancy, to produce inflammation of the womb; or whatever would, under other circumstances, excite inflammation of almost any organ, has, at that time, its injurious effect determined to this particular one.

Some careful observers have occasionally attributed abortion to disproportion in size between the male and the female. Farmers were formerly too fond of selecting a great overgrown bull to serve their dairy or breeding cows, and many a heifer or little cow was seriously injured; and she either cast her calf or was lost in parturition. The breeders of cattle in later years are beginning to act more wisely in this matter.

Cows that are degenerating into consumption are exceedingly subject to abortion. They are continually in heat; they rarely become pregnant, or, if they do, a great proportion of them cast their calves. Abortion, also, often follows a sudden

change from poor to luxuriant food. Cows that have been out half-starved in the winter, when incautiously turned on rich pasture in the spring, are too apt to cast their calves from the undue general or local excitation that is set up. Hence it is that, when this disposition to abort first appears in a herd, it is naturally in a cow that has been lately purchased. Fright, from whatever cause, may produce this trouble. There are singular cases on record of whole herds of cows slinking their calves after having been terrified by an unusually violent thunder storm. Commerce with the bull soon after conception is also a frequent cause, as well as putrid smells—other than those already noticed—and the use of a diseased bull. Besides these tangible causes of abortion, there is the mysterious agency of the atmosphere. There are certain seasons when abortion is strangely frequent and fatal; while at other times it disappears in a manner for several successive years.

The consequences of premature calving are frequently of a very serious nature; and even when the case is more favorable the results are, nevertheless, very annoying. The animal very soon goes again to heat, but in a great many cases she fails to become pregnant; she almost invariably does so, if she is put to the bull during the first heat after abortion. If she should come in calf again during that season, it is very probable that at about the same period of gestation, or a little later, she will again abort; or that, when she becomes in calf the following year, the same fatality will attend her. Some say that this disposition to cast her young gradually ceases; that, if she does miscarry, it is at a later and still later period of pregnancy; and that, in about three or four years, she may be depended upon as a tolerably safe breeder. He, however, would be sadly inattentive to his own interests who keeps a profitless beast so long.

The calf very rarely lives, and in the majority of cases it is born dead or putrid. If there should appear to be any chance of saving it, it should be washed with warm water, carefully dried, and fed frequently with small quantities of new milk, mixed, according to the apparent weakness of the animal, either with raw eggs or good gruel; while the bowels should, if occasion requires, be opened by means small doses of castor-oil. If any considerable period is to elapse before the natural time of pregnancy would have expired, it will usually be necessary to bring up the little animal entirely by hand.

The Treatment.—The treatment of abortion differs but little from that of parturition. If the farmer has once been tormented by this pest in his dairy, he should carefully watch the approaching symptoms of casting the calf, and, as soon as he perceives them, should remove the animal from the pasture

to a comfortable cow-house or shed. If the discharge be glairy, but not offensive, he may hope that the calf is not dead; he will be assured of this by the motion of the fœtus, and then it is possible that the abortion may still be avoided. He should hasten to bleed her, and that copiously, in proportion to her age, size, condition, and the state of excitation in which he may find her; and he should give a dose of physic immediately after the bleeding. When the physic begins to operate, he should administer half a drachm of opium and half an ounce of sweet spirits of nitre. Unless she is in a state of great debility, he should allow nothing but gruel, and she should be kept as quiet as possible. By these means he may occasionally allay the general or local irritation that precedes or causes the abortion, and the cow may yet go to her full time.

Should, however, the discharge be fetid, the conclusion will be that the fœtus is dead, and must be got rid of, and that as speedily as possible. Bleeding may even then be requisite if much fever exists; or, perhaps, if there is debility, some stimulating drink may not be out of place. In other respects the animal must be treated as if her usual time of pregnancy had been accomplished.

Much may be done in the way of preventing this habit of abortion among cows. The fœtus must be got rid of immediately. It should be buried deep and far from the cow-pasture. Proper means should be taken to hasten the expulsion of the placenta. A dose of physic should be given; ergot of rye administered; the hand should be introduced, and an effort made, cautiously and gently, to detach the placenta; all violence, however, should be carefully avoided; for considerable and fatal hemorrhage may be speedily produced. The parts of the cow should be well washed with a solution of the chloride of lime, which should be injected up the vagina, and also given internally. In the meantime, and especially after the expulsion of the placenta, the cow-house should be well washed with the same solution.

The cow, when beginning to recover, should be fattened and sold. This is the first and grand step toward the prevention of abortion, and he is unwise who does not immediately adopt it. All other means are comparatively inefficient and worthless. Should the owner be reluctant to part with her, two months, at least, should pass before she is permitted to return to her companions. Prudence would probably dictate that she should never return to them, but be kept, if possible, on some distant part of the farm.

Abortion having once occurred among the herd, the breeding cows should be carefully watched. Although they should be well fed, they should not be suffered to get into too high

condition. Unless they are decidedly poor and weak, they should be bled between the third and fourth months of pregnancy, and a mild dose of physic administered to each. If the pest continues to reappear, the owner should most carefully examine how far any of the causes of abortion that have been detected, may exist on his farm, and exert himself to thoroughly remove them.

Garget.—This is an inflammation of the internal substance of the udder. One or more of the teats, or whole sections of the udder, become enlarged and thickened, hot, tender, and painful. The milk coagulates in the bag, and causes inflammation where it is deposited, which is accompanied by fever. It most commonly occurs in young cows after calving, especially when in too high condition. The secretion of milk is very much lessened, and, in very bad cases, stopped altogether. Sometimes the milk is thick, and mixed with blood. Often, also, in severe cases, the hind extremities, as the hip-joint, hock, or fetlock, are swollen and inflamed to such an extent that the animal cannot rise. The simplest remedy, in mild cases, is to put the calf to its mother several times a day. This will remove the flow of milk, and often dispel the congestion.

TREATMENT.—Sometimes the udder is so much swollen that the cow will not permit the calf to suck. If the fever increases, the appetite declines, and rumination ceases. In this stage of the complaint, the advice of a scientific veterinary practitioner is required. A dose of purging medicine and frequent washing of the udder, in mild cases, are usually successful. The physic should consist of epsom salts, one pound; ginger, half an ounce; nitrate of potassa, half an ounce; dissolved in a quart of boiling water; then add a gill of molasses, and give to the cow lukewarm. Diet moderate; that is, on bran, or, if in summer, green food. There are various medicines for the different forms and stages of garget, which, if the above medicine fails, can be properly prescribed by a skillful veterinary practitioner.

It is important that the udder should be frequently examined, as matter may be forming, which should be immediately released. Various causes are assigned for this disease, such as exposure to cold and wet, or the want of proper care or attention in parturition.

An able writer says that hasty drying up a cow often gives rise to inflammation and indurations of the udder, difficult of removal. Sometimes a cow lies down upon and bruises the udder, and this is another cause. But a very frequent source, and one for which there can be no excuse, is the failure to milk a cow clean. The calf should be allowed to suck often,

and the cow should be milked at least twice a day as clean as possible, while suffering from this complaint.

If the udder is hot and feverish, a wash may be used, consisting of eight ounces of vinegar and two ounces of camphoretted spirit; the whole well and thoroughly mixed, and applied just after milking, to be washed off in warm water before milking again.

In very bad cases, iodine has often been found most effectual. An iodine ointment may be prepared by taking one drachm of hydriodate of potash and an ounce of lard, and mixing them well together. A small portion of the mixture, from the size of a pigeon's egg, in limited inflammations, to twice that amount, is to be well rubbed into the swollen part, morning and night.

When milk forms in the bag before parturition, so as to cause a swelling of the udder, it should be milked away; and a neglect of this precaution often leads to violent attacks of garget.

Prevention is always better than cure. The reason most commonly given for letting the cow run dry for a month or two before calving is that after a long period of milking her system requires rest, and that she will give more milk and do better the coming season than if milked up to the time of calving.

This is all true, and a reason sufficient in itself for drying off the cow some weeks before parturition; but there is another important reason for the practice, which is that the mixture of the old milk with the new secretion is liable to end in an obstinate case of garget.

To prevent any ill effects from calving, the cow should not be suffered to get too fat, which high feeding, after drying off, might induce.

The period of gestation is about two hundred and eighty-four or two hundred and eighty-five days. But cows sometimes overrun their time, and have been known to go three hundred and thirteen days, and even more; while they now and then fall short of it, and have been known to calve in two hundred and twenty days. If they go much over the average time, the calf will generally be a male.

False Presentation.—The cow, when about to calve, ought not to be disturbed by too constant watching. The natural presentation of the fœtus is with the head lying upon the fore legs. If in this position, nature will generally do all. But, if the presentation is unnatural, and the labor has been long and ineffectual, some assistance is required. The hand, well greased, may be introduced, and the position of the calf changed; and, when in a proper position, a cord should be tied round the fore legs, just above the hoofs; but no effort

should be made to draw out the calf till the natural throes are repeated. If the nostril of the calf has protruded, and the position is then found to be unnatural, the head cannot be thrust back without destroying the life of the calf.

The false position most usually presented is that of the head first, with the legs doubled under the belly. A cord is then fixed around the lower jaw, when it is pushed back, to give an opportunity to adjust the fore legs, if possible. The object must now be to save the life of the cow.

But the cases of false presentation, though comparatively rare, are so varied that no direction could be given which would be applicable in all cases.

After calving, the cow will require but little care, if she is in the barn, and protected from changes of weather. A warm bran mash is usually given, and the state of the udder examined.

Puerperal or Milk Fever.—Calving is often attended with feverish excitement. The change of powerful action from the womb to the udder causes much constitutional disturbance and local inflammation. A cow is subject to nervousness in such circumstances, which sometimes extends to the whole system, and causes puerperal fever. This complaint is called dropping after calving, because it succeeds that process. The prominent symptom is a loss of power over the motion of the hind extremities, and inability to stand; sometimes loss of sensibility in these parts, so that a deep puncture with a pin, or other sharp instrument, is unfelt.

This disease is much to be dreaded by the farmer on account of the high state of excitement and the local inflammation. Either from neglect or ignorance, the malady is not discovered until the manageable symptoms have passed, and extreme debility has appeared. The animal is often first seen lying down, unable to rise; prostration of strength and violent fever are brought on by inflammation of the womb. But soon a general inflammatory action succeeds, rapid and violent, with complete prostration of all the vital forces, bidding defiance to the best selected remedies.

Cows in very high condition, and cattle removed from low keeping to high feeding, are the most liable to puerperal fever. It occurs most frequently during the hot weather of summer, and then it is most dangerous. When it occurs in winter, cows sometimes recover. In hot weather they usually die.

Milk fever may be induced by the hot drinks often given after calving. A young cow at her first calving is rarely attacked with it. Great milkers are most commonly subject to it; but all cows have generally more or less fever at calving. A little addition to it, by improper treatment or neglect, will

prevent the secretion of milk; and thus the milk, being thrown back into the system, will increase the inflammation.

This disease sometimes shows itself in the short space of two or three hours after calving, but often not under two or three days. If four or five days have passed, the cow may generally be considered safe.

SYMPTOMS.—The animal is restless, frequently shifting her position; occasionally pawing and heaving at the flanks. Muzzle hot and dry, the mouth open, and tongue out at one side; countenance wild; eyes staring. She moans often, and soon becomes very irritable. Delirium follows; she grates her teeth, foams at the mouth, tosses her head about, and frequently injures herself. From the first, the udder is hot, enlarged and tender, and, if this swelling is attended by a suspension of milk, the cause is clear. As the case is inflammatory, its treatment must be in accordance; and it is usually subdued without much difficulty.

TREATMENT.—A pound to one and a half pounds of epsom or Glauber's salts, according to the size and condition of the animal, should be given, dissolved in a quart of boiling water; and, when dissolved, add pulv. red pepper a quarter of an ounce; caraway, do. do.; ginger, do. do.; mix, and add a gill of molasses, and give luke warm. If this medicine does not act on the bowels, the quantity of ginger, capsicum, and caraway, must be doubled. The insensible stomach must be aroused. When purging in an early stage is begun, the fever will more readily subside. After the operation of the medicine, sedatives may be given, if necessary.

The digestive function first fails, when the secondary or low state of fever comes on. The food discharged ferments; the stomach and intestines are inflated with gas, and swell rapidly. The nervous system is also attacked, and the poor beast staggers. The hind extremities show the weakness; the cow falls and cannot rise; her head is turned on one side, where it rests; her limbs are palsied. The treatment in this stage must depend on the existence and degree of fever. The pulse will be the only true guide. If it is weak, wavering, and irregular, we must avoid depleting, purgative agents. The blood flows through the arteries, impelled by the action of the heart, and its pulsations can be very distinctly felt by pressing the finger upon almost any of these arteries that is not too thickly covered by fat or the cellular tissues of the skin, especially where it can be pressed upon some hard or bony substance beneath it. The most convenient place is directly at the back part of the lower jaw, where a large artery passes over the edge of the jaw bone to ramify on the face. The natural pulse of a full grown ox will vary from about forty-eight to fifty-five

beats a minute; that of a cow is rather quicker, especially near the time of calving; and that of a calf is quicker than that of a cow. But a very much quicker rate than that indicated will show a feverish state or inflammation, and a much slower pulsation indicates debility of some kind.

Next in importance, as we have already stated, is the physic. The bowels must be opened, or the animal will fall a victim to the disease. All medicines should be of an active character, and in sufficient quantity; and stimulants should always be added to the purgative medicines, to insure their operation. Ginger, gentian, caraway, or red pepper in powder, may be given with each dose of physic. Some give a powerful purgative, by means of epsom salts, one pound; flour of sulphur, four ounces; powdered ginger, a quarter of an ounce; all dissolved in a quart of cold water, and one-half given twice a day till the bowels are opened. The digestive organs are deranged in most forms of milk fever, and the third stomach is loaded with hard, indigestible food. When the medicine has operated, and the fever is subdued, little is required but good nursing to restore the patient.

No powerful medicines should be used without discretion; for, in the milder forms of the disease, as the simple palsy of the hind extremities, the treatment, though of a similar character, should be less powerful, and every effort should be made for the comfort of the cow by providing a thick bed of straw, and raising the forequarters to assist the efforts of nature, while all filth should be carefully and promptly removed. She may be covered with a warm cloth, and warm gruel should be frequently offered to her, and light mashes. An attempt should be made several times a day to bring milk from the teats. The return of milk is an indication of speedy recovery.

Milch cows in too high condition appear to have a constitutional tendency to this complaint, and one attack of it predisposes them to another.

Simple Fever.—This may be considered as increased arterial action, with or without any local affection; or it may be the consequence of the sympathy of the system with the morbid condition of some particular part. The first is pure or idiopathic fever. Pure fever is of frequent occurrence in cattle. Symptoms as follows: Muzzle dry; rumination slow or entirely suspended; respiration slightly accelerated; the horn at the root hot, and its other extremity frequently cold; pulse quick; bowels constipated; coat staring and the cow is usually seen separated from the rest of the herd. In slight attacks, a cathartic of salts, sulphur and ginger is sufficient. But, if the common fever is neglected or improperly treated, it may assume, after a time, a local determination, as pleurisy or inflammation of the

lungs or bowels. In such cases the above remedy would be insufficient, and a veterinary surgeon to manage the case would be necessary. Symptomatic fever is more dangerous and is commonly the result of injury, the neighboring parts sympathizing with the injured part. Cattle become unwell, are stinted in their feed, have a dose of physic, and in a few days are well; still a fever may terminate in some local affection. But in both cases pure fever is the primary disease.

A more dangerous form of fever is that known as symptomatic. As we have said, cattle are not only subject to fever of common intensity, but to symptomatic fever, and thousands die annually from its effects. But the young and the most thriving are its victims. There are few premonitory symptoms of symptomatic fever. It often appears without any previous indications of illness. The animal stands with her neck extended, her eyes protruding and red, muzzle dry, nostrils expanded, breath hot, base of the horn hot, mouth open, pulse full, breathing quick. She is often moaning; rumination and appetite are suspended; she soon becomes more uneasy; changes her position often. Unless these symptoms are speedily removed, she dies in a few hours.

TREATMENT.—The name of the ailment, inflammatory or symptomatic fever, shows the treatment necessary, which must commence with purging. Salts here, as in most inflammatory diseases, are the most reliable. From a pound to a pound and a half, with ginger and sulphur in a dose, dissolved in warm water or thin gruel. If this does not operate in twelve hours, give half the dose, and repeat once in twelve hours until the bowels are freed. After the operation of the medicine the animal is relieved. The sedative medicines may be given. Sal ammoniac, one drachm; powdered nitre, two drachms; should be administered in thin gruel two or three times a day, if required.

Bronchitis.—The trachea and bronchial tubes are frequently the seat of inflammation, especially in the spring of the year—the symptoms of which are often confounded with those of other pulmonary diseases. This inflammation is frequently preceded by catarrhal affections; cough is often present for a long time before the more acute symptoms are observed. Bronchitis occasionally makes its appearance in an epizootic form.

SYMPTOMS.—A peculiarly anxious expression of the countenance will be observed; respiration laborious; a husky, wheezing, painful cough; on placing the ear to the windpipe a sonorous rale is heard; symptomatic fever also prevails to a greater or lesser extent.

TREATMENT.—Counter irritation should be early resorted to; strong mustard, mixed with equal parts of spirits of hartshorn and water, and made into a thin paste, should be applied all along the neck over the windpipe, and to the sides, and should be well rubbed in; or the tincture of cantharides with ten drops of castor-oil to each ounce, applied in the same manner as the former, will be found equally effective. Give internally ten drops of Fleming's tincture of aconite every four hours until five or six doses have been given; after which give one of the following powders twice a day: Nitrate of potash, one ounce; Barbadoes aloes, one ounce; Jamaica ginger, half an ounce; pulverized-gentian root, one ounce; mix and divide into eight powders. If necessary a pound of salts may be given.

Diseases of the Teats.—OBSTRUCTION AT THE ENDS OF THE TEATS.—It occasionally happens that a fungous or watery excerescence makes its appearance at the end and centre of the teat, which obstructs the flow of milk, and is very annoying and painful to the animal. This should be removed by the scalpel, taking care to dissect away every portion of the morbid growth. The part is then to be sprinkled with powdered bloodroot, in order to prevent union of the edges of the the outlet of the teat. The milk-tube, well oiled, must now and then be introduced.

OBSTRUCTION IN THE TEATS.—A simple obstruction in the teats is frequently occasioned by imperfect union in the lining membrane.

TREATMENT.—This is easily remedied by introducing a tube constructed for the purpose, which should be well lubricated with olive oil and allowed to remain in the lactiferous channel for several hours daily, or until all danger of readhesion has passed away. The lactiferous outlet is sometimes obstructed by false membranes running across its channel. These must be annihilated by the introduction of the tube.

TUMORS IN THE TEATS.—Tumors are occasionally found in the teats. Their presence is determined by bulbous enlargement, which, on manipulation, appear very evident.

TREATMENT.—The method of operation in such cases is to introduce a tube, well smeared with iodine ointment, and repeat the operation two or three times daily, until the milk passes freely.

INJURIES TO THE TEATS.—There are many cases of injury to the teats in the form of an incision, which occurred accidentally on the animal rising from the ground, cutting or lacerating the same with its own hoofs.

Treatment.—When the accident is discovered shortly after it happens, the parts may be drawn together by uninterrupted suture. The seam is then coated with collodion, and the milk must be evacuated wholly by the tube until the parts have united. Sometimes the union is not complete, but a small fistulous opening is left, through which the milk is constantly dribbling. The only way to remedy this is to convert the fistula into a simple flesh-wound. This is done by means of a sharp-pointed knife, which removes the thin callus forming the interior of the fistula. The raw edges are then to be brought together by suture, and collodion and the tube used as before.

Sore Teats.—Treatment.—First, wash with warm water and Castile soap; then lubricate the parts with equal portions of lime-water and linseed oil.

Chapped Teats and Chafed Udder.—Treatment.—Foment the parts daily with an infusion of camomile flowers for at least fifteen minutes at a time; then wipe dry and use the lime liniment. These temporary, or what might, with more propriety, be termed local, maladies, will, if the system be free from morbid matter, generally yield to local remedies. If, however, no change for the better can be observed, the following aperient should be given :

Cow-pox.—Two varieties of sore teats occur in the cow, in the form of pustular eruption. They first appear as small vesicles containing a purulent matter, and subsequently assume a scabby appearance, or small ulcers remain, which often prove troublesome to heal. This latter is the cow-pox, from which Jenner derived the vaccine matter.

Treatment.—Foment the teats well with warm water and Castile soap; after which, wipe the bag dry, and dress with citrine ointment. The preparations of iodine have also been recommended, and they are very serviceable.

Coryza.—In the spring, and late in the fall, catarrhal affections are quite common, occurring frequently in an epizootic form. Coryza, or nasal catarrh, commonly called a cold in the head, is not very common among cows. As its name implies, it is a local disease, confined to the lining membrane of the nose; and, consequently, the general system is not usually disturbed.

Symptoms.—The animal will be observed to sneeze; the schneiderian membrane (membrane of the nose) is heightened in color; cough sometimes accompanies; there is also a mucopurulent discharge from the nose. Neglect to attend to these early symptoms frequently occasions disease of a more serious nature. In fact, coryza may be regarded as the forerunner of all epizootic pulmonary disorders.

TREATMENT.—The animal should be kept on a low diet for a few days; the nostrils occasionally steamed, and one of the following powders given night and morning, which, in most cases, will be all the medicine required: Nitrate of potassa, one ounce; digitalis leaves pulverized and tartrate of antimony, of each one drachm; sulphate of copper, two drachms. Mix, and divide into eight powders. Should the disease prove obstinate, give for two or three days two ounces of epsom salts at a dose, dissolved in water, three times a day.

Diarrhœa.—Cattle are frequently subject to this disease, particularly in the spring of the year when the grass is young and soft. Occasionally it assumes a very obstinate form in consequence of the imperfect secretion of gastric juice; the fæces are thin, watery, and fetid, followed by very great prostration of the animal.

The symptoms of diarrhœa are too well known to require any detailed description.

TREATMENT.—If in a mild form, the diet should be low; give two ounces of epsom salts twice a day. In a more obstinate form, give two drachms of carbonate of soda in the food. Oak-bark tea will be found very useful in these cases; or one of the following powders, twice a day, will be found very advantageous: Pulverized opium and catechu, each one and a half ounces: prepared chalk, one drachm; to be given in the feed.

Calves are particularly subject to this disease, and it often proves fatal to them. It sometimes assumes an epizootic form, when it is generally of a mild character. So long as the calf is lively and feeds well, the farmer should entertain no fear for him; but if he mopes about, refuses his food, ceases to ruminate, wastes in flesh, passes mucus and blood with the fæces, and exhibits symptoms of pain, the case is a dangerous one.

In such an emergency, lose no time, but give two or three ounces of castor-oil with flour-gruel, or two ounces of salts at a dose, followed with small draughts of oak-bark tea; or give, twice a day, one of the following powders: Pulverized catechu, opium, and Jamaica ginger, of each, half an ounce; prepared chalk, one ounce. Mix, and divide into twelve powders. Bran washes, green food, and flour-gruel should be given, with plenty of salt.

Dysentery.—This disease is very frequently confounded with the foregoing. A distinction, however, exists, since inflammation appears in this disease, while it is absent in the former. In this affection, inflammation of the large intestines takes place, which is attended with diarrhœa. The fæces are covered with blood; the animal rapidly becomes prostrated, and death frequently comes to its relief

It is, however, with dysentery that the practioner is most loth to cope, a disease that betrays thousands of cattle. This, also, may be either acute or chronic. Its causes are too often buried in obscurity, and its premonitory symptoms are disregarded or unknown. There appears to be a strong predisposition in cattle to take on this disease. It seems to be the winding up of many serious complaints, and the foundation of it is sometimes laid by those that appear to be of the most trifling nature. It is that in cattle which glanders and farcy are in the horse—the breaking up of the constitution.

Dysentery may be a symptom and concomittant of other diseases. It is one of the most fearful characteristics of murrain; it is the destructive accompaniment, or consequence, of phthisis. It is produced by the sudden disappearance of a cutaneous eruption; it follows the cessation of chronic hoose; it is the consequence of the natural or artificial suspension of every secretion. Were any secretion to be particularly selected, the repression of which would produce dysentery, it would be that of the milk. How often does the farmer observe that no sooner does a milch cow cease her usual supply of milk than she begins to purge! There may not appear to be anything else the matter with her; but she purges, and, in the majority of cases, that purging is fatal.

It may sometimes, however, be traced to sufficient causes, exclusive of previous disease. Unwholesome food—exposure to cold—neglect at the time of calving—low and marshy situations—the feeding in meadows that have been flooded, where it is peculiarly fatal—the grazing upon the clays lying over the blue lias rock—the neighborhood of woods and of half-stagnant rivers—the continuation of unusually sultry weather—overwork, and all the causes of acute dysentery, may produce that of a chronic nature; an acute dysentery—neglected, or badly, or even most skillfully treated—may degenerate into an incurable chronic affection. Half starve a cow, or overfeed her, milk her to exhaustion, or dry her milk too rapidly—and dysentery may follow.

Symptoms.—The following will, probably, be the order of the symptoms, if they are carefully observed: There will be a little dulness or anxiety of countenance, the muzzle becoming short or contracted; a slight shrinking when the loins are pressed upon; the skin a little harsh and dry; the hair a little rough; there will be a slight degree of uneasiness and shivering that scarcely attracts attention; then—except it be the degeneracy of acute into chronic dysentery—constipation may be perceived. It will be, to a certain extent, obstinate; the excrement will be voided with pain; it will be dry, hard, and expelled in small quantities. In other cases, perhaps, purging

will be present from the beginning; the animal will be tormented with tenesmus, or frequent desire to void its excrement, and that act attained by straining and pain, by soreness about the anus, and protrusion of the rectum and sometimes by severe colicky spasms. In many cases, however, and in those of a chronic form, few of these distressing symptoms are observed, even at the commencement of the disease; but the animal voids her fæces oftener than it is natural that she should, and they are more fluid than in a state of health; while at the same time she loses her appetite and spirits and condition, and is evidently wasting away.

TREATMENT.—Give one drachm of the extract of belladonna, three times a day, dissolved in water; or calomel and powdered opium, of each one drachm three times daily. As soon as the inflammatory stage passes by, give one of the following three times daily, in their gruel: Nitrate of potash pulverized, gentian-root pulverized, of each one ounce; pulverized Jamaica ginger, one-half an ounce; pulverized caraway, or anise seed, six drachms. A bottle of porter, given once or twice a day, will be found of very great advantage.

The Hoove, or Hoven.—This is brought on by a derangement of the digestive organs, occasioned by over-feeding on green and luxuriant clover, or other luxuriant food. It is simply the distension of the first stomach by carbonic acid gas. In later stages, after fermentation of the contents of the stomach has commenced, hydrogen gas is also found. The green food, being gathered very greedily after the animal has been kept on dry, and perhaps unpalatable hay, is not sent forward so rapidly as it is received, and remains to overload and clog the stomach, till this organ ceases or loses the power to act upon it. Here it becomes moist and heated, begins to ferment, and produces a gas which distends the paunch of the animal, which often swells up enormously. The cow is in great pain, breathing with difficulty, as if nearly suffocating. Then the body grows cold, and, unless relief is at hand, the cow dies.

TREATMENT.—Prevention is both cheaper and safer than cure; but if by neglect, or want of proper precaution, the animal is found in this suffering condition, relief must be afforded as soon as possible, or the result will be fatal.

A hollow flexible tube, introduced into the gullet, will sometimes afford a temporary relief till other means can be had, by allowing part of the gas to escape; but the cause is not removed either by this means or by puncturing the paunch, which is often dangerous

In the early stage of the disease the gas may be neutralized by ammonia, which is usually near at hand. Two ounces of

liquid ammonia, in a quart of distilled or rain water, given every quarter of an hour, will prove beneficial. A little tincture of ginger, essence of aniseed, or some other cordial, may be added, without lessening the effect of the ammonia.

If the case has assumed an alarming character, the flexible tube, or probang, may be introduced, and afterwards take three drachms ether of the chloride of soda, dissolve in a pint of water, and pour it down the throat. Lime-water, potash, and sulphuric ether, are often used with effect.

In desperate cases it may be found necessary to make an incision through the paunch; but the chloride of lime will, in most cases, give relief at once by neutralizing the gas.

Choking.—This is often produced by feeding on roots, particularly round and uncut roots, like the potato. The animal slavers at the mouth, tries to raise the obstruction from the throat. This method, if adopted, should be attended with great care and patience, or the tender parts will be injured. If the obstruction is low down, and a tube is to be inserted, a pint of olive or linseed oil first turned down will so lubricate the parts as to aid the operation, and the power applied must be steady. If the gullet is torn by the carelessness of the operator, or the roughness of the instrument, a rupture generally results in serious consequences. A hollow tube is best, and if the object is passed on into the paunch, the tube should remain a short time, to permit the gas to escape. In case the animal is badly swelled, the dose of chloride of lime, or ammonia, should be given, as for the hoove, after the obstruction is removed.

Care should be taken, after the obstruction is removed, to allow no solid food for some days.

Foul in the Foot.—Cows and other stock, when fed in low, wet pastures, will often suffer from ulcers or sores, generally appearing first between the claws. This is commonly called foul in the foot, and is analogous to foot-rot in sheep. It is often very painful, causing severe lameness and loss of flesh, and discharges a putrid matter or pus. Sometimes it first appears in the form of a swelling near the top of the hoof which breaks and discharges foul matter.

TREATMENT.—The rough and common practice among farmers is to fasten the foot in the same manner as the foot of an ox is fastened in shoeing, and draw a rough rope back and forth over the ulcerated parts, so as to produce a clean, fresh wound, and then dress it with tar or other similar substance.

This is often an unnecessarily cruel operation. The loose matter may easily be removed by a knife, and then carefully wiped off with a moist sponge. The animal should then be removed at once to a warm, dry pasture, or kept in the barn.

If the case has been neglected till the pasterns become swollen and tender, the sore may be thoroughly cleansed out, and dressed with an ointment of sulphate of iron, one ounce; molasses, four ounces; simmered over a slow fire till well mixed. Apply on a piece of cotton batting, and secure upon the parts. If any morbid growth or fungus appear, use equal parts of powdered blood-root and alum sprinkled on the sore, and this will usually effect a cure.

Some also give a dose of flour of sulphur, half an ounce; powdered sassafras-bark, one ounce, and burdock, two ounces; the whole steeped in a quart of boiling water, and strained when cool; and, if the matter still continues to flow from the sore, wash it morning and night with chloride of soda, one ounce, or a tablespoonful of common salt dissolved in a pint of water.

Foul in the foot causes very serious trouble, if not taken in season. The health of cows is injured to a great extent.

The Mange.—This is commonly brought on by half-starving in winter, and by keeping the cow in a filthy, ill-ventilated place. It is contagious, and if one cow of a herd has it, the rest will be apt to get it also. Blaine says, "Mange has three origins—filth, debility and contagion." It is a disgrace to the farmer to suffer it to enter his herd from either of these causes, since it shows a culpable neglect of his stock. It is too common in this country, especially in filthy barns.

Symptoms.—The cow afflicted with the mange is hide-bound, the hair is dry and stiff, and comes of. She is constantly rubbing, and a kind of white scurfiness appears on the skin. It is most perceptible toward the latter part of winter and in spring, and thus too plainly tells the story of the winter's neglect.

Treatment.—An ointment composed chiefly of sulphur has been found most effectual. Some mercurial ointment may be added if the cows are kept housed; but, if let out during the day, the quantity must be very small, else salivation is produced by their licking themselves.

The ointment may be made of flour of sulphur, one pound; strong mercurial ointment, two ounces; common turpentine, one-half pound; lard, one and a quarter pounds. Melt the turpentine and lard together, and stir in the sulphur as they begin to cool off; then rub down the mercurial ointment on some hard substance with the other ingredients. Rub the whole in with the hand, and take care to leave no places untouched once a day for three days; and, after this, if any places are left uncured, rub it in over them. There is no danger in this application if the animal is not exposed to severe cold. This will

be pretty sure to effect a speedy cure, if aided by cleanliness, pure air and a nutritious diet.

Another wash for mange is the following: Pyroligneous acid, four ounces; water, a pint; mix and apply.

Lice.—Lice show unpardonable neglect of duty wherever they are suffered to exist. They crawl all over the stable floor and the stalls, on the pastures, and a touch is sufficient to give them to other animals. They worry the poor animal constantly, and no thriftiness can be expected where they are found. If the mange ointment does not completely destroy them, as it often will, take bees-wax, tallow and lard, in equal parts, and rub it into the hide in the most thorough manner, with the hand or brush, two and a half pounds for a small cow, three pounds for a large one. The next day it may be washed off in soft soap, and the lice will have disappeared from the animal, but not always from the barn. Some use a wash of powdered lobelia-seeds, two ounces, steeped in boiling water, and applied with a sponge. Others hang up tobacco leaves over the stalls. This may do to keep them away, but after the animal is covered with them, they are not so easily scared.

Warbles.—The gad-fly is very troublesome to cattle towards the end of summer. The fly alights on the back of the cow, punctures the skin, and lays her egg under it. A tumor is now formed, varying in size, which soon bursts and leaves a small hole for the grub already hatched to breathe through. Here the insect feeds on its surroundings and grows up to considerable size. All this time the animal is probably suffering more or less pain, and often tries to lick or rub the part affected, if possible. Farmers often press them out with finger and thumb. The best way is to puncture the skin with a common pen-knife, and then press out the grub. They injure the hide more than most people are aware of.

Loss of cud is a consequence of indigestion, and is often brought on by eating too greedily of food which the cow is not used to. Loss of cud and loss of appetite are synonymous. Gentle purgatives may be given, with such as salts, ginger and sulphur. But when a cow is surfeited, as already said, I should prefer to withhold food entirely, or for the most part, till the system can regulate itself.

Epizootic Catarrh.—Catarrh frequently assumes an epizootic form of a very virulent character, originating spontaneously and extending over a large section of country at or about the same time. A cold spring succeeding a mild winter is productive of malignant catarrh. This is one of the most distressing and fatal diseases to which cattle are subject.

SYMPTOMS.—The animal appears dull and unwilling to

move about, staggering when forced to do so; obstinate costiveness is usually one of the earliest symptoms, succeeded by diarrhœa, which is equally difficult of management; sometimes, however, diarrhœa is present from the first; the animal loses flesh rapidly; the coat is staring; the appetite is lost; tumors form about the head, neck, back, and joints, which appear to be filled with air, and upon pressure cause a crepitating sound; saliva flows from the mouth, becoming very fetid as the disease progresses. The animal always dies of putrefaction.

Treatment.—This disease should be treated early, or not at all. Good nursing is very essential. When costiveness is present, give Barbadoes aloes, one ounce; croton-oil, ten drops; mix together; or give one pint of linseed oil, to which add from ten to twenty drops of castor-oil. If the bowels are not open in twenty-four hours, give four ounces of sulphate of magnesia every six hours until they are opened. Follow this with tincture of aconite, ten drops in water every four hours, until the fever has abated.

Bleeding has been recommended by some writers; but the author has failed to experience any benefit from resorting to it; but, on the contrary, has seen much injury result from the use—or, rather, the abuse—of the lancet. He is, indeed, inclined to attribute much of the fatality attending this disease to indiscriminate blood-letting.

When much debility exists, the animal should be sustained by stimulants. One ounce of nitric ether, and half an ounce of tincture of opium, given in a little water, will be found beneficial. It should be given twice a day. Pulverized gentian-root, one ounce; Jamaica ginger, half an ounce; pulverized cloves, half an ounce; mixed, and divided into four powders, one to be given at night and morning, will be found useful in place of the opium and ether.

Gastro-Enteritis.—This disease—otherwise known as wood-evil, or moor-evil—arises from eating the buds of oak, young ash, and other trees, which are of a very highly stimulating or irritating character. As the intestinal canal is liable to inflammatory action from irritant substances admitted into it, animals are found to become diseased from eating too freely of these vegetable substances.

Symptoms.—Loss of appetite and suspended rumination; mouth hot; skin dry; pulse from sixty to seventy; swelling and pain of the belly; obstinate constipation; fæces hard and covered with blood; urine of a strong odor, highly colored, and voided with difficulty.

Treatment.—The animal should be bled and a strong purgative administered, followed by aconite and belladonna, as

in enteritis. Injections of Castile-soap and water should be freely used; the application of the mustard, hartshorn and water to the belly will also be found very beneficial.

Inflammation of the Lungs.—Inflammation of the lungs, known also as pneumonia, is not usually so prevalent among the bovine as it proves to be in the equine species, excepting, however, milch cows, located in unventilated milking establishments. In such locations diseases of the lungs are often fearfully prevalent, raging, at times, as an epizootic affection, which generally proves fatal when a large number of animals are confined in a small place.

Among horses this disease is often occasioned by laborious work and feats of speed, which produce rapid and sometimes distressing respiration; but among cattle whose powers of speed and endurance are not often put to the test, we may reasonably infer that the exciting causes vary in their general character.

The stimulating and morbid action of an impure atmosphere may produce this disease by first creating irritation on the lining membrane of the respiratory passages. It has also been noticed that this disease frequently appears among cattle that have been driven a long distance and have also been compelled to go hungry and thirsty for many hours. Fortunately for the poor brute, this disease is not so painful as bronchitis, pleurisy and laryngitis; and, after having passed through the acute stage, it assumes a sort of mild, subacute or chronic type, which, apparently, appears less dangerous than the acute kind; yet, after all, is more so, as it is apt to terminate in altered structure, hepatization, induration, and tubercles.

Pneumonia, now and then, terminates by metastasis; that is, by translation of the formidable lung difficulty to one equally formidable, which locates in the feet, known to veterinarians as liminitis (fever in the feet). Among cattle, however, this termination is rather rare, yet very frequent among horses. When the disease does not take this course it often ends in "resolution," which signifies a return to health, without leaving any perceivable evidence of altered structure; so that, after awhile, the animal may become sound as ever.

Pneumonia is divided into several forms or stages, but, as they have reference to its degree or intensity, it seems unnecessary to refer to them. It may, however, be proper to inform the reader that pneumonia may exist either as a state of congestion or of inflammation. Congestion signifies a distended or plethoric state of the blood-vessels of the parenchyma of the lungs, and slow motion of blood. Congestive pneumonia sometimes sets in as suddenly as that which is termed "inflammatory," and among cattle the former is more prevalent. In

the congestive stage, the symptoms are those of embarrassment, the blood courses through its channels sluggishly, and there is not the activity of heart and lungs which is perceivable in pneumonia.

SYMPTOMS.—The symptoms, in the early stage, are such as are generally observed at the commencement of any inflammatory affection; namely, coldness of extremities and shivering fits; loss of appetite; labored respiration, quick pulse, slight cough, mouth hot and clammy. The animal will not lie down, and refuses to move; the head is extended, perhaps drooping, and the fore-legs stand wide apart. As the disease progresses these symptoms vary, and the appearance of the membrane of the mouth, nose and eyes vary also, from the color of bright scarlet to that of a leaden hue. In the congestive stage, the pulse is more voluminous, yet less active, and the visible surfaces are highly congested. A cough, slight or active, as the case may be, is usually noticed; it is a sort of deep-seated, half-suppressed cough, and sometimes is the first symptom which attracts the owner's attention to the ailing animal.

TREATMENT.—It is very important, at the commencement of the treatment, that the patient shall be placed in a clean, comfortable location, where pure air abounds; for, under such circumstances, the condition favorable to the operation of Nature in the cure of the malady are secured. Should the animal labor under accelerated respiration, and full, strong pulse, administer one ounce of powdered nitre in a quart of cold water; after which, four ounces of the liquor acetate of ammonia may be given, every four hours. This agent also should have a quart of cold water added to it at every dose. The brisket and sides may be rubbed with a portion of the following: Powdered mustard and strong vinegar, enough of each to form a thin paste. When mixed, a small quantity of oil of cedar may be added. This application should be repeated two or three times in the course of twenty-four hours. Nauseants are next administered, in view of relaxing capillary and muscular constrictions, and this is desirable, as such conditions tend to equalize the circulation of the blood and prevent an undue quantity accumulating in the pulmonary organs.

A couple of quarts of infusion of lobelia may occasionally be thrown into the rectum. Considerable of the active principle of lobelia may be absorbed within this gut, and, under the circumstances, it is much better to introduce the medicine into the system in this way than by the stomach. The proportions of the lobelia to the water are:

2 ounces of lobelia (herb).
2 quarts of boiling water.

When cool, strain, and it is fit for use.

It may be necessary to give a dose of medicine; if so, use the following:

12 ounces of Glauber salts.
1 drachm of ginger.
1 quart of warm water.

It should be known to all husbandmen that a disease of this character, located in such important organs as those of respiration, is very prostrating, and operates very unfavorably on the inherent vitality of parts; hence, as soon as the activity of the morbid phenomena is somewhat subdued, all active medication should cease.

The affection is likely to continue for some days, and all we have to do is to try to keep the patient alive while the disease is running its course. Careful nursing, pure air and light diet are the remedies. After the first twenty-four hours, pay little attention to the pulse, but more to the patient, for there are but two conditions in this case—one acute, the other chronic. The very moment the acute condition subsides, it merges into the chronic, and requires life-sustaining agents. After the first twenty-four hours resort to the following medicine:

8 ounces of glycerine.
4 drachms of powdered bloodroot.
1 ounce of powdered golden seal
4 ounces of water. Mix.

Dose, one tablespoonful, to be smeared on the tongue night and morning.

Management Under Treatment.—As already intimated, a full supply of pure air must be insured; for a practitioner would be more likely to save an animal in the open air (provided the weather is not too cold or tempestuous) than in the unventilated cow-house. Should the limbs at any time be cold, they are to be hand-rubbed and bandaged; the body being in the same condition, must also be clothed. Also give the chilled patient some warm ginger-tea, or any other non-alcoholic stimulant or carminative, in view of arousing the action of the heart and capillaries, by which means the red arterial and life-sustaining blood would be forced to the external surface, and extremities, imparting to them a genial warmth and thus insuring an equilibrium of the circulating fluid. The patient should be furnished constantly with a bucket of pure, cold water. When morbid thirst prevails, the water must be acidulated with either lemon juice, cream of tartar or acetic acid. Any symptoms of debility or lassitude are to be opposed by a few doses of some vegetable tonic. Tincture of golden seal or tincture of matico, in ounce doses every twelve hours, are the best remedies that I am acquainted with.

Pharnygitis. — Sore Throat. — The term pharyngitis

signifies inflammation of the membrane lining in the pharyngitis inlet, or funnel-like entrance into the œsophagus, or gullet.

Symptoms.—The subject is unable to swallow, and thus the food taken into the mouth is apt to be returned by the nostrils. This happens occasionally, although the passage of the nasal inlet is much smaller than it is in the horse. On exploring the interior region of the throat, from ear to ear, considerable swelling or tumefaction is encountered, yet the pharyngial muscles appear to be constricted. It generally appears among cattle as a simple local affection, yet it often accompanies other diseases of the respiratory character, and, whenever it does appear as a local malady, it is apt to merge into something else. It is a very distressing affection, and the animal gets but little relief until suppuration commences; then a free discharge takes place.

Treatment.—Let the animals throat be rubbed twice daily with

1 ounce oil of cedar.
6 ounces of cod liver oil.
2 drachms spirits of ammonia. Mix.

Keep a sloppy bran-mash before the patient, or some flax-seed tea, into which stir a small quantity of powdered nitre of licorice. This will relieve the cough if any be present, and tend to lessen irritation of the lining membrane of the pharynx. When the patient begins to expectorate, or has the least discharge from the nose, give

2 ounces balsam of tolu.
3 ounces of sweet spirits of nitre.
8 ounces of mucilage of gum arabic.

Dose, one wine-glassful twice daily.

Pulmonary Appoplexy.—This disease occasionally appears among cattle in the Western States. It attacks animals irrespective of age, sex, or condition. It is generally sudden in its attacks, and death frequently ensues in the course of a few hours.

Symptoms.—The pulse and respirations are very much accelerated, the former sometimes running as high as 110; an augmented salivary secretion is observed to run from the mouth; the tongue is much swollen; so, also, are the eyelids, and tears run down each side of the face; various parts of the body are swollen and congested; the stomach is distended with gas, and the evacuations are profuse and watery. Post-mortem examinations reveal a highly congested state of the lungs; in fact, they are engorged with blood, and the muscles in the region of the tumefied parts are in a similar engorged condition.

Treatment.—No time should be lost in administering the

following drench, for it will preserve the tissues against decomposition, and, perhaps, save the animal:

12 drachms of pyroligneous acid.
1 pint of water.
1 ounce of tincture of matico.

Repeat the dose after a lapse of six hours, and rub the tumefaction occasionally with

1 ounce of oil of cedar.
2 ounces of tincture of capsicum.
4 ounces of tincture of bayberry bark. Mix.

It appears that in this disease there is a morbid impulse directed to various parts, which results in local accumulations, rendering the parts turgid. Then the blood is thrown out of the capillary vessels, and sometimes they suffer a rupture, which accounts for the engorgement and extravasation.

Murrain.—This is one of the most malignant diseases to which cattle are liable. Fortunately, however, true murrain is comparitively rare in this great stock-raising country.

Symptoms.—The entire system seems to partake of the disease. The first indication of its approach is a feverish condition of the system, attended with a frequent and painful cough; the pulse is small, hard, and rapid. As the disease advances, the respiration becomes disturbed; the flanks heave; vesicular eruption is observed upon the teats, mouth, and feet; the horns are cold; the animal is sometimes lame; constipation and, sometimes, diarrhœa are accompanying symptoms; fæces black and fetid; the eyes weep and become much swollen; great tenderness along the spine; a brown, or bloody discharge from the nose and mouth; the animal moans incessantly, grinds his teeth, rarely lies down, but to get up again quickly; finally, the breath becomes very offensive; tumors make their appearance in various parts of the body, which, in favorable cases, suppurate, and discharge a fetid matter.

Treatment.—Give one-fourth of a pound of epsom salts, with one drachm of Jamaica ginger, twice a day, for two or three days. A bottle of porter, twice a day, will be found serviceable. Very little medicine is required internally in this disease, but much depends upon good nursing. External applications are chiefly to be depended upon. A solution of chloride of lime should be applied to the eruptions, or a solution of the chloride of zinc, twenty grains to an ounce of water; or, of sulphate of zinc, two drachms to a pint of water; or pulverized charcoal applied to the parts will be found useful.

Navel-ill.—Inflammation of the navel in calves occasionally occurs, causing redness, pain, and sudden swelling in the part

affected. This disease, if not promptly attended to, speedily carries off the creature.

TREATMENT.—Foment the part well with warm, hop-tea; after which, the application of a cloth, well saturated with lead water and secured by bandages, should be applied. Internally, doses of epsom salts, of two ounces each, dissolved in half a pint of water, should be given until the bowels are acted upon. After the inflammation has subsided, to counteract the weakness which may follow, give a bottle of porter two or three times a day.

Phrenitis.—Inflammation of the brain is one of those dreadful diseases to which all animals are liable. It is known to the farmer as frenzy, mad staggers, etc.

SYMPTOMS.—The active symptoms are preceded by stupor; the animal stubbornly stands in one position; the eyes are full, red, and fiery; respiration rapid; delirium soon succeeds; the animal, bellowing, dashes wildly about, and seems bent on mischief, rushing madly at every object which comes in its way.

The causes of this disease are overwork in warm weather, a plethoric condition of the system, and too stimulating food.

TREATMENT.—As this is attended with considerable risk, unless it is taken prior to the frenzied stage, bleeding almost to fainting should be resorted to, and followed by a brisk purge. Take one ounce of Barbadoes aloes, and ten to fifteen drops of croton oil; mix the aloes with one pint of water and the oil, using the mixture as a drench. One pound of epsom salts will answer the purpose very well, in cases where the aloes and oil cannot be readily obtained. Application of bags of broken ice to the head is very beneficial. Spirits of turpentine, or mustard, together with spirits of hartshorn and water, should be well rubbed in along the spine, from the neck to the tail.

Pleurisy.—This is an inflammation of the pleura, or the serous membrane which lines the cavity of the chest, and which is deflected over the lungs. Inflammation of this membrane rarely occurs in a pure form, but is more generally associated with inflammation of the tissue of the lungs. If this disease is not attended to at an early period, its usual termination is in hydrothorax, or dropsy of the chest. The same causes which produce inflammation of the lungs, of the bronchia, and of the other respiratory organs, produce also pleurisy.

SYMPTOMS.—The respiration is quick, short and painful; pressure between the ribs produces much pain; a low, short, painful cough is present; the respiratory murmur is much diminished; in fact, it is scarcely audible. This condition is

rapidly followed by effusion, which may be detected from the dullness of the sounds, on applying the ear to the lower part of the lungs. The febrile symptoms disappear; the animal for a few days appears to improve, but soon becomes weak, languid, and often exhausted, from the slightest exertion.

TREATMENT.—The same treatment in the early stage is enjoined as in inflammatory pneumonia, which the reader will consult—counter irritation and purgatives. Bleeding never should be resorted to. When effusion takes place, it is necessary to puncture the sides with a trochar, and draw away the fluid, giving internally one of the following purges three times a day: Resin, eight ounces; saltpetre, two ounces; mix, and divide into eight powders. Half-drachm doses of the iodide of potash, dissolved in water, to be given three times daily, will be found useful in this disease.

Aphthæ.—This disease is commonly known as "thrush," or sore mouth. It appears as a vesicular eruption on the tongue, gums, and on the buccal and palatine membrane. When the disease is mild, and confined to the above parts, it is easily cured by daily applications of a portion of the following:

2 ounces of powdered golden seal.
1 ounce of tincture of matico.
4 ounces of honey. Mix.

Apply by means of a swab or sponge.

When the disease is violent, and of long standing, it it apt to extend through the whole course of the alimentary canal, from the mouth to the anus. If this be the case, the animal will purge, as if a powerful cathartic had been administered, and will be otherwise unwell. The method of cure, in this event, is to prescribe tonics and astringents. The remedies are tincture of matico, golden seal, and sulphur, in the following proportions:

4 drachms of tincture of matico.
2 drachms of powdered golden seal.
2 drachms of sulphur.
1 pint of water. Mix.

The patient's diet should consist of oatmeal gruel, slightly alkalized with hyposulphite of soda.

Milk taken from cows affected with this disease should never be drank, as it will most readily produce aphthæ in man.

Flatulent Colic.—This disease is generally occasioned by some derangement of the digestive organs, whereby the food, instead of being properly digested, undergoes fermentation, and thus carbonic acid gas, or sulphureted hydrogen, is evolved.

SYMPTOMS.—It is attended by considerable pain; the animal will be very restless, continually lying down and getting

up again; discharges gas from the anus; strikes the belly occasionally with the hind feet, and the abdomen is enlarged.

TREATMENT.—This species of colic can generally be relieved as follows: Take one ounce of hyposulphite of soda, dissolve the same in a quart of water; then add tincture of ginger and tincture of golden seal, of each one ounce. Drench the animal with the same. Clysters of soapsuds, to which a little salt may be added, should be thrown into the rectum occasionally. The belly should be well rubbed with coarse straw, and, in severe cases, rub some mustard, moistened with vinegar, on the lower part of the abdomen. After a lapse of two hours, should the patient appear unrelieved, a second dose of the colic drench may be given. Generally, however, one dose is sufficient.

Spasm of the Bowels.—Spasm of the bowels, generally termed spasmodic colic, is occasioned by contraction of the longitudinal and circular fibres of the muscular tunic of the intestines. In this disease nearly the same symptoms are observed as those alluded to in flatulent colic, and he has periods of relaxation from pain which return at intervals with increased violence. It is supposed that this affection is caused by the presence of irritating matters in the intestinal canal, either in the form of bad food, poisonous plants, or water impregnated with lead. As the muscles of the intestines belong to that class known as involuntary, it follows that the state of spasm is the result of some excitability or deranged condition of the nerves of involuntary motion; hence antispasmodics are indicated. To relieve the spasm:

1 drachm of powdered assafœtida.
2 drachms of sulphuric ether.
1 pint of thin gruel. Mix.

Use as a drench; then administer, occasionally, an antispasmodic clyster, composed of warm water and a small quantity of powdered lobelia.

Failing to relieve the animal by the above means, get him under the influence of sulphuric ether, to be applied to the nostrils by means of a sponge. There is no necessity for fully etherizing the animal, for, if kept in a partial state of stupefaction for about twenty minutes, the spasm will relax; after which, let the patient be kept on bran-mashes for a day or more.

Constipation.—Constipation is generally the result of impaired digestion; yet, now and then, it is the precursor of some definite malady. The old method of resorting to powerful cathartics generally aggravates the symptoms, and the animal dies unrelieved of the constipation.

TREATMENT.—The best method of treating this affection is to administer, with an aperient, stimulants and bitters; in this way we arouse the action of the digestive organs, and create a lax state of the bowels. Let the following drench be given:

12 ounces of Glauber salts.
3 drachms of powdered golden seal.
2 drachms of powdered ginger.

Dissolve the Glauber salts in one quart of tepid water; then add the other ingredients. After the lapse of eight hours, the animal should be walked about, have its belly rubbed, and an occasional clyster of warm soap suds may be thrown into the rectum. Should the medicine not operate at the expected time, administer two drachms of powdered mandrake, the same quantity of golden seal, and half an ounce of hyposulphite of soda, in about a quart of water.

To prevent a recurrence of the constipation, let the animal have half an ounce of equal parts of golden seal and carbonate of soda daily, which may be mixed in the food. It is important, also, in view of guarding against constipation, to make some change in the diet. Thus, if the animal has been long fed on meal, some coarser material (shorts) should be substituted, for a brief period, at least.

Rabies.—Hydrophobia in cattle is the result of the bite of a rabid dog, from which bite no animal escapes. The effects produced by the wound made by the teeth of such an animal, after the virus is once absorbed into the circulation of the blood, are so poisonous that all treatment is useless. The proper remedies must be instantly applied to prevent this absorption, or the case is utterly hopeless. Among men, nine out of every ten bitten by rabid dogs escape the terrible effects resulting from this dreadful disorder, without resorting to any applications to prevent it. It is a well established fact that men, when bitten by dogs, are generally wounded in some part protected by their clothing, which guards them from the deleterious effects of the saliva which covers the teeth, and which, at such times, is deadly poison. The teeth, in passing through the clothing, are wiped clean, so that the virus is not introduced into the blood; hence the comparitively few cases of rabies occurring in man. When, however, the wound is made, upon an exposed surface, as the flesh of the hand, or of the face, this fatal disease is developed in spite of every precaution, unless such precautions are immediately taken. For this reason, cattle, when bitten, do not escape the disease.

SYMPTOMS.—The animal separates itself from the rest of the herd, standing in a kind of stupor, with the eyes half-closed; respiration natural; pulse quickened; temperature of body and

limbs natural, the slightest noise agitates, causing the eyes to glare and exciting bellowing; the bark of a dog produces the most violent effects; the animal foams at the mouth and staggers when it walks; if water is offered, the muzzle is plunged into it, but the victim cannot drink; in making the effort, the most fearful consequences are produced. The animal now seeks to do mischief—and the quicker it is then destroyed the better.

TREATMENT.—This must be applied quickly or not at all. The moment the animal is bitten, that moment the wound should be searched for, and, when found, should be freely opened with a knife, and lunar caustic, caustic potash, or the per-manganate of potash at once applied to all parts of the wound, care being taken not to suffer a single scratch to escape. This, if attended to in time, will save the animal.

Red Water.—This disease derives its name from the color of the urine voided in it. It is one of the most common complaints of horned cattle, and one of the most troublesome to manage.

SYMPTOMS.—Respiration hurried; rumination ceases; a high degree of fever presented; the animal moans, arches the back and strains in passing the urine, which is tinged with blood, or presents the appearance of pure blood. The cause is almost invariably feeding on turnips that have grown on damp, ill-drained land, and very often a change of diet stops the spread of this disease in the byre. Other succulent food, grown under similar circumstances, may produce the same symptoms, tending to disturb the digestive organs and the blood-forming process.

In the course of investigations as to the cause of various cattle-diseases, and of red-water in particular, it has been found that it is unknown on well-drained farms and in dairies where turnips are used only in a moderate degree. The land of poor people furnish the roots most likely to induce this disorder; it is a disease essentially attacking the poor man's cow; and, to be seen and studied, requires a practice extending into the less favorably situated parts of the country. On large farms, where good stock is well kept, and in town dairies, where artificial food is used to supplement the supply of turnips, it is seldom now seen.

SYMPTOMS.—General derangement attracts the dairyman's attention, and, upon observing the urine which the animal has voided, it seems to be of a red, or of a reddish brown, or claret color; sometimes transparent, at others clear. The color increases in depth; other secretions are checked; the animal becomes hide-bound and the milk goes off. Appetite and

rumination are suspended; the pulse becomes extremely feeble and frequent—as in all debilitating, or anæmic disorders—the heart's action is loud and strong, with a decided venous pulse, or apparent regurgitation, in the large veins of the neck.

In some cases, if even a small quantity of blood be withdrawn, the animal drops in a fainting state. In red water, the visible mucous membranes are blanched and the extremities cold, indicating the languid state of the blood's circulation and the poverty of the blood itself. Constipation is one of the most obstinate complications, and many veterinary surgeons—aware that, if the bowels can be acted on, the animal is cured—have employed purgatives in quantities far too large, inducing at times even death. Occasionally diarrhœa is one of the first, and notof the unfavorable, symptoms.

Treatment.—Give one pint of linseed-oil; clysters of soap and water should be freely used, and give plenty of linseed-tea to drink. When the urine is abundant, give one ounce of tincture of opium, with one drachm of powdered aloes, three times, at intervals of six or eight hours

Rheumatism.—This is a constitutional inflammatory affection of the joints affecting the fibrous tissue and serous, or synovial, membrane. It is caused by exposure to cold and wet; being quite common in low, marshy sections.

Symptoms.—Loss of appetite; upon forcing the animal to move, every joint seems stiffened; nose dry; coat staring; constipation is also an attendant symptom; the joints, one or more, become swollen and painful. This may be regarded as a metastic, or shifting disease; first one part, and then another, seems to be affected.

Treatment.—Mild purgatives should be used; one-half-ounce doses of colchicum-root, pulverized, will be found useful; one-ounce balls of pine-tar may also be given with advantage. As a local application, the author has found nothing to equal kerosene oil, one pint, to two ounces of aqua ammonia, well rubbed in two or three times a day.

Inflammation of the Kidneys.—Symptoms.—Cattle affected with inflammation of the kidneys will be observed to have some slight roaching of the back; that is to say, instead of the back or spinal column being straight or slightly concave, as it ought to be, it now presents a convexity, or, in other words, is arched in a upward or superior direction. The arching of the back is occasioned by tonic spasms of the psoas and iliac muscles, located above the kindeys in the lumbar region. These muscles are known to butchers as "tenderloin." On making pressure over the region of the kidneys, the animal will be observed

to flinch, the parts appearing very tender and hot. The animal is generally dull; the muzzle dry; a chilliness of the horns and external surface is observed, showing very clearly that there is an unequal circulation of the blood. There is generally some difficulty in passing the urine; the animal strains in the act of passing it, and it is redder than usual. The symptoms vary as the disease progresses, but the above are the principal ones on which the diagnosis must be founded.

TREATMENT.—Drench the animal with twelve ounces of Glauber salts, dissolved in a quart of warm water, then apply warm water bandages to the region of the loins, which may be retained in their place by encircling the body with a bandage. An emollient clyster of slippery elm should occasionally be thrown into the rectum, and the patient should be drenched with four ounces of the liquor acetate of ammonia every six hours, until an improvement takes place. Then give tincture of matico, in half-ounce doses, night and morning, until the patient is better.

Inflammation of the Liver—Cattle and young stock, when fed too high, or when allowed to luxuriate in a rich meadow, are often attacked with an acute disease of the liver.

SYMPTOMS.—The principal symptoms of this malady are yellowness of the membrane which lines the eyelids, and covers that part known as the "white of the eye." The visible surfaces of the mouth are also of a yellow tinge. In addition to the above symptoms, the animal is feverish, thirsty; mouth and base of the horns hot; pulse accelerated; breathing rather laborious; rumination is suspended, and the animal is said to have "lost its cud." Some fullness will also generally be observed on the right side, in the region of the liver, and the animal will occasionally turn its head in that direction, as if it were the seat of pain, which is probably the case; yet the most reliable symptoms, in a disease of this character, are a yellow tinge of the visible surface, accompanied by febrile symptoms.

TREATMENT.—The most rational method of treating this disease is to endeavor to mitigate the inflammatory diathesis, and restore the normal function of the liver. To accomplish these desirable results use the following prescription:

16 ounces of Glauber salts.
2 drachms powdered mandrake.

The salts should be dissolved in one quart of tepid water; then add the mandrake, and drench the animal by means of a common porter-bottle. This drench should be poured down the œsophagus in a gradual manner, so as to prevent its being received into the rumen, or paunch.

The patient should, if possible, be dieted on green fodder. If this cannot be procured, some sliced cabbage, turnips, or carrots may be substituted. A teaspoonful of mandrake should be given daily in the food, until the visible surfaces assume their natural color. A curable case will generally yield under the above treatment.

This disease sometimes runs into a chronic type, and is known by the yellow cover of visible surfaces, dull, sleepy appearance of the subject, and absence of those acute symptoms which are invariably present in the inflammatory stage. A chronic disease of this character may exist for months and even years without interfering very essentially with the general health. Finally, however, the liver undergoes alterations in structure, becomes hardened or indurated, or else it becomes turberculous, or is the seat of hydatids, and the fluke-worm is often found in the ducts. The treatment for chronic disease of the liver is as follows:

2 drachms powdered iodide of potassium.
4 ounces powdered golden seal. Mix.

Divide the mass into six equal parts, and give one in a little water, every morning, on an empty stomach. The medicine may be continued for some length of time without the least danger. If this treatment does not benefit the animal, the case is probably incurable.

Gadflies.—The gadfly is known to naturalists as the œstris bovis. It punctures the integument of cattle, and then deposits its ova, or eggs. In this situation the ova mature, until they are capable of enjoying an independent existence. They then make their exit through the external outlet, fall to and burrow into the ground, and remain there until the period of their metamorphosis takes place, when they assume the form of winged insects. In this form they multiply the species by the deposit of their ova. They probably occasion much irritation; and, in view of getting rid of them, puncture the tumor, by means of a thumb-lancet, and squeeze out the parasite

The gadfly not only persecutes healthy oxen by its bites, during summer, but also deposits its eggs in their skin, which give rise to tumors on the back and other parts, in which the larvæ become developed. They live there on the succulent fluid which the soft parts secrete, and make their escape thence in the following spring, in order to become metamorphosed. The greater the number of tumors, the more is the strength of the animal diminished by the pain and suppuration. For this reason we should endeavor to free the animal, as soon as possible, from these larvæ pests, by frequently washing these tumors with camphorated brandy, or forcibly compressing them, which either crushes the insect or forces it to make its exit. When

they have attained the size of a filbert, an incision must be made into the part, which is then to be covered with a pitch plaster. A few doses of sulphur are to be given internally. We are told that those oxen which have taken sulphur for a long period of time are not infested by gadflies.

Yoke Galls.—The exciting cause is local irritation, occasioned by the yoke.

TREATMENT.—So soon as an abrasion is discovered on the neck, the animal should be excused from duty for a few days. The abraded part should be lubricated, two or three times daily, with a small quantity of glycerine. In most cases, however, a few applications of tincture of aloes and myrrh will produce a healthy action, and thus restore the parts to soundness. Should there be no abrasion, yet some tumefaction, heat, and tenderness, a cold water bandage, renewed as occasion seems to require, will, in most cases, have the desired effect. Occasionally the integuments are so bruised as to induce induration (hardening). Local induration in the neck is a morbid condition of parts, known to the farriers of old as "sit-fast." The treatment consists in smearing the part with a portion of the following:

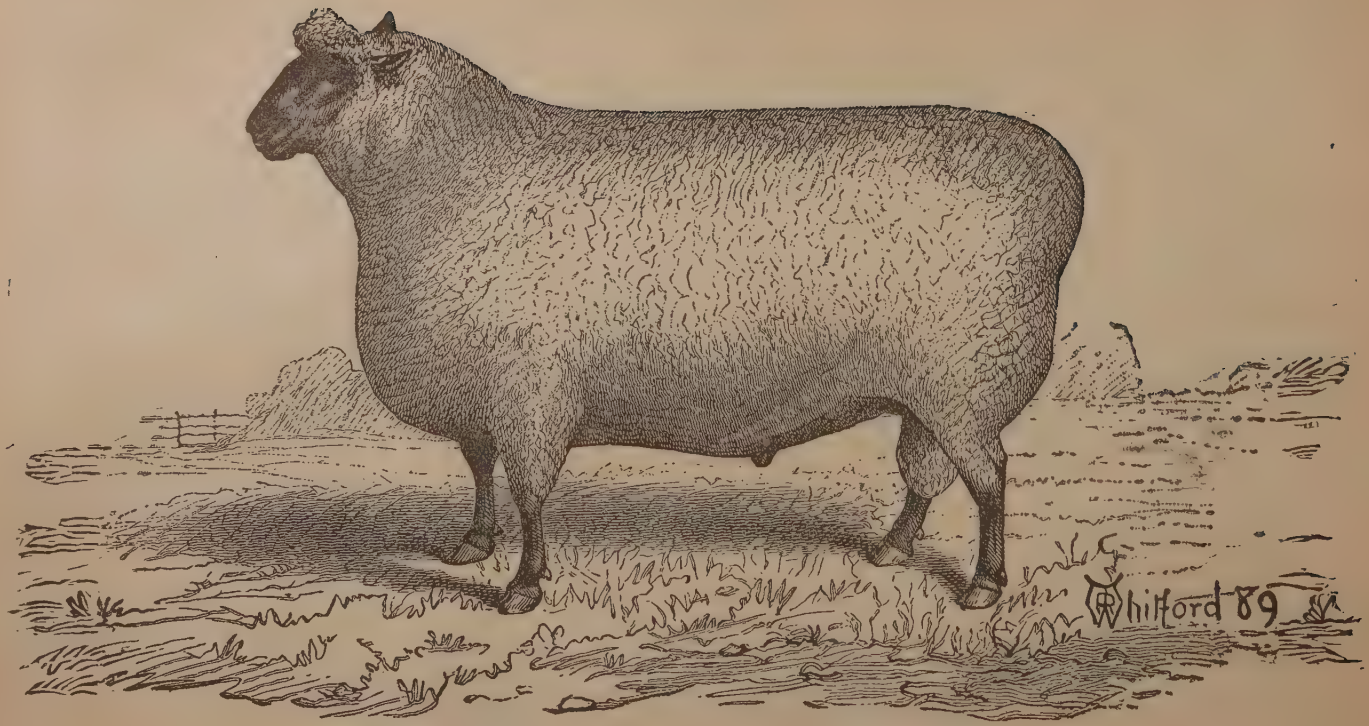
½ drachm of iodine.
7 drachms of simple ointment.
½ drachm of powdered bloodroot. Mix.

A few applications of a portion of the above will have the effect of removing the sit-fast, or eschar, when a healthy granulating surface will appear.

Some animals, owing to a peculiarity of constitution, will "chafe," as the saying is, in those parts which come in contact with the yoke, and no human foresight or mechanical contrivance can prevent it; therefore, in view of protecting the parts against the local irritation and its consequences, the following liquid cuticle is good:

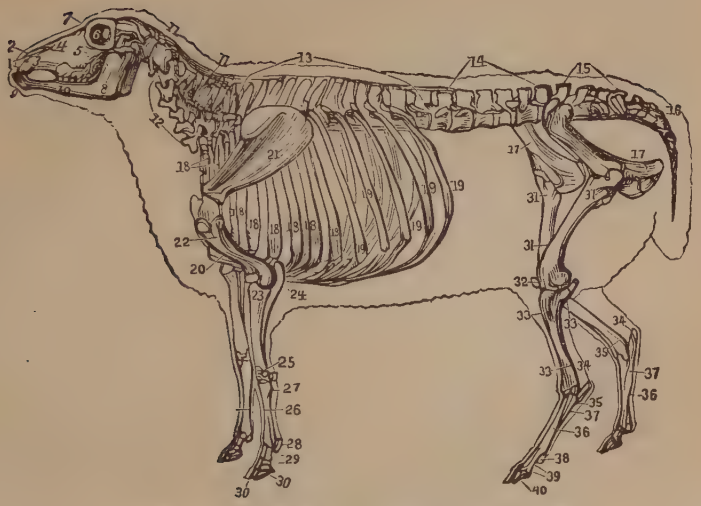
Equal parts of { Collodion. / Castor oil.

After washing the abrasion with soap and water, wipe dry, and smear it all over with a portion of the above invaluable liquid cuticle.



"THE BURSAR," (773) A TYPICAL OXFORD DOWN.

SHEEP.



SKELETON OF THE SHEEP AS COVERED BY THE MUSCLES.

1.—The intermaxillary bone. 2—The nasal bones. 3.—The upper jaw. 4.—The union of the nasal and upper jaw bones. 5.—The union of the molar and lachrymal bones. 6.—The orbits of the eye. 7.—The frontal bone. 8.—The lower jaw. 9.—The incisor teeth, or nippers. 10.—The molars or grinders. 11.—The ligament of the neck supporting the head. 12.—The seven vertebræ, or the bones of the neck. 13.—The thirteen vertebræ, or bones of the back. 14.—The six vertebræ of the loins. 15.—The sacral bone. 16.—The bones of the tail, varying in different breeds from twelve to twenty-one. 17.—The haunch and pelvis. 18.—The eight true ribs with their cartilages. 19.—The five false ribs, or those that are not attached to the breast-bone. 20.—The breast-bone. 21.—The scapula, or shoulder-blade. 22.—The humerus, bone of the arm, or lower part of the shoulder. 23.—The radius, or bone of the fore-arm. 24.—The ulna, or elbow. 25.—The knee with its different bones. 26.—The metacarpel or shank-bones—the larger bones of the leg. 27.—A rudiment of the smaller metacarpel. 28.—One of the sessamoid bones. 29.—The first two bones of the foot—the pasterns. 30.—The proper bones of the foot. 31.—The thigh-bone. 32.—The stifle joint and its bone—the patella. 33.—The tibia, or bone of the upper part of the leg. 34.—The point of the hock. 35.—The other bones of the hock. 36.—Metatarsal bones, or bone of the hind-leg. 37.—Rudiment of the small metatarsal. 38.—A sessamoid bone. 39.—The first two bones of the foot—the pasterns. 40.—The proper bones of the foot

With the exception of the dog, there is not one of the brute creation which exhibits the diversity of size, color, form, covering and general appearance which characterizes the sheep, and none which occupies a wider range of climate or subsists on a greater variety of food. In every latitude, between the equator and the arctic, he ranges over sterile mountains, and through the fertile valleys. He feeds on almost every species of edible forage, the cultivated grasses, clovers, cereals and roots; he browses on aromatic and bitter herbs; he crops the leaves and bark from the stunted forest shrubs, and the pungent, resinous evergreens. In some parts of Norway and Sweden, when other resources fail, he subsists on fish or flesh during their long and rigorous winters, and, if reduced to necessity, he eats his own wool. He is diminutive like the Orkney, or massive like the Teeswater. He is policerate or many-horned; he has two large or small spiral horns like the Merino, or is polled or hornless like the long-wooled. He has a long tail like our own breeds; a broad-tail, like many of the Eastern, or a mere button of a tail, like the fat rumps, discernible only by the touch. His coat is sometimes long and coarse, like the Lincolnshire; short and hairy, like those of Madagascar; soft and furry, like the Angola, or fine and spiral, like the silken Merino or Saxon. Their color, either pure or fancifully mixed, varies from the white or black of our own country to every shade of brown, dun, buff, blue and gray, like the spotted flocks of the Cape of Good Hope and other parts of Africa and Asia. This wide diversity is the result of long domestication, under almost every conceivable variety of condition.

Native Sheep.—Strictly speaking, there are no sheep indigenous to North America, excepting the Rocky Mountain sheep. Before the introduction of the improved European breeds, during the past century, our sheep consisted generally of a hardy, long-legged, coarse, open-fleeced animal, which yielded, according to attention and feed, from one and a half to four pounds of indifferent wool. We have seen numerous flocks, within the last thirty years, of the old natives, whose bellies were entirely destitute of wool, and sometimes the whole carcass was bare, excepting a mere strip or ridge like a

mane, reaching from the head to the tail. The wool which was retained on the neck, back and sides, was frequently matted almost as firmly as a leather apron; and that on the thighs, and sometimes on the sides, was often composed almost wholly of long hair. Although indifferently formed in comparison with the best breeds of the present day, being thin in the breast and back, light quartered, and slow in coming to maturity, they yet possessed some good qualities. They were prolific, and made excellent nurses.

There were occasionally some smutty-nosed, or brockle-faced, sheep among them, distinguished by their additional size, superior merits and courage. These were usually the leaders of the flock in their marauding expeditions on their neighbor's domains, and, in common with the others, were eminently adapted to purvey for themselves on the frontier settlements. There were, besides, some black, or dark chocolate-brown, members in every flock, which were much valued by the thrifty housewife for their wool, which afforded an economical mixture for jackets, hose and trousers, known as sheep's gray. Our original stock were principally derived from England, where their counterparts may be seen at the present day, in the refuse breeds of that country. When these sheep were well selected and properly bred, there was rapid and satisfactory improvements, and from such flocks, mixed with some of the more recently improved varieties, have sprung many valuable animals.

The Spanish Merino.—The Spanish sheep, in different countries, has, either directly or indirectly, effected a complete revolution in the character of the fleece. The race is unquestionably one of the most ancient extant. The early writers on agriculture and the veterinary art, describe various breeds of sheep as existing in Spain, of different colors—black, red, and tawny. The black sheep yield a fine fleece, the finest of that color which was then known; but the red fleeces of Bætica—a considerable part of the Spanish coast on the Mediterranean, comprising the modern Spanish provinces of Gaen, Cordova, Seville, Andalusia, and Granada, which was early colonized by the enterprising Greeks—was, according to Pliny, of still superior quality, and "had no fellow."

The Merino race possess inbred qualities to an extent surpassed by no others. They have been improved in the general weight and evenness of their fleece, as in the celebrated flock of Rambouillet; in the uniformity and excessive fineness of the fibre, as in the Saxons; and in their form and feeding qualities, in various countries; but there has never yet been deterioration, either in quantity or quality of fleece or carcass, wherever they have been transported, if supplied with suitable food and attention. Most sheep annually shed their wool if unclipped; while the Merino retains its fleece, sometimes for five years, when allowed to remain unshorn.

Conclusive evidence is thus afforded of continued breeding among themselves, by which the very constitution of the wool-producing organs beneath the skin have become permanently established; and this property is transmitted, to a great extent, even among the crosses, thus marking the Merino as an ancient and peculiar race.

The first impression made by the Merino sheep, on one unacquainted with its value, would be unfavorable. The wool lying closer and thicker over the body than in most other breeds, and being abundant in yolk—or a peculiar secretion from the glands of the skin, which nourishes the wool and causes it to mat closely together—is covered with a dirty crust, often full of cracks. The legs are long, yet small in the bone; the breast and the back are narrow, and the sides somewhat flat; the fore-shoulders and bosoms are heavy, and too much of their weight is carried on the coarser parts. The horns of the male are comparatively large, curved, and with more or less of a spinal form; the head is large, but the forehead rather low. A few of the females are horned; but, generally speaking, they are without horns. Both male and female have a peculiar coarse and unsightly growth of hair on the forehead and cheeks, which the careful shepherd cuts away before the shearing time; the other part of the face has a pleasing and characteristic velvet appearance. Under the throat there is a singular looseness of skin, which gives them a remarkable appearance of throatiness or hollowness in the neck. The pile of hair, when pressed upon, is hard and unyielding, owing to the thickness into which it grows on the pelt, and the abundance

of the yolk, retaining all the dirt and gravel which falls upon it; but, upon examination, the fibre exceeds in fineness, and in the number of serrations and curves, that which any other sheep in the world produces. The average weight of the fleece in Spain is eight pounds from the ram, and five from the ewe. The staple differs in length in different provinces. When fatted, these sheep will weigh from twelve to sixteen pounds per quarter.

The excellence of the Merinos consists in the unexampled fineness and felting property of their wool, and in the weight of it yielded by each individual sheep; the closeness of that wool, and the luxuriance of the yolk, which enable them to support extremes of cold and wet quite as well as any other breed; the readiness with which they adopt themselves to every change of climate, retaining, with common care, all their fineness of wool, and thriving under a burning tropical sun, and in the frozen regions of the north; an appetite which renders them apparently satisfied with the coarsest food; a quietness and patience into whatever pasture they are turned; and a gentleness and tractableness not excelled in any other breed

Their defects—partly attributable to the breed, but more to the improper mode of treatment to which they are occasionally subjected—are, their unthrifty and unprofitable form; a tendency to abortion, or barrenness; a difficulty of yeaning, or giving birth to their young; a paucity of milk; and a too frequent neglect of their lambs. They are likewise said, notwithstanding the fineness of their wool, and the beautiful red color of the skin when the fleece is parted, to be more subject to cutaneous affections than most other breeds. Man, however, is far more responsible for this than nature. Everything was sacrificed in Spain to fineness and quantity of wool. These were supposed to be connected with equality of temperature, or, at least, with freedom from exposure to cold; and, therefore, twice in the year, a journey of four hundred miles was undertaken, at the rate of eighty or a hundred miles per week —the spring journey commencing when the lambs are scarcely four months old. It is difficult to say in what way the wool of the migratory sheep was, or could be, benefited by these periodical journeys. Although among them is found the finest and

most valuable wool in Spain, yet the stationary sheep, in certain provinces—Segovia, Leon and Estremadura—are more valuable than the migratory flocks of others. Moreover, the fleece of some of the German Merinos—which do not travel at all, and are housed all the winter—greatly exceed that obtained from the best migratory breed—the Leonese—in fineness and felting property; and the wool of the migratory sheep has been, comparatively speaking, driven out of the market by that from sheep which never travel. With respect to the carcass, these harassing journeys, occupying one-quarter of the year, tend to destroy all possibility of fattening, or any tendency toward it, and the form and the constitution of the flock are deteriorated, and the lives of many sacrificed.

The term Merino, it must be remembered, is but the general appellation of a breed, comprising several varieties, presenting essential points of difference in size, form, quality and quantity of wool. These families have generally been merged, by interbreeding, in the United States and other countries, which have received the race from Spain. Purity of Merino blood, and actual excellence in the individual and its ancestors, form the only standard in selecting sheep of this breed. Families have, indeed, sprung up in this country, exhibiting wider points of difference than did those of Spain. This is owing, in some cases, doubtless, to particular causes of breeding; but, more often, probably, to concealed or forgotten infusions of other blood. The question, which has been at times raised, whether there are any Merinos in the United States, descendants of the early importations, of unquestionable purity of blood, has been conclusively settled in the affirmative.

The minor distinctions among the various families into which, as has already been intimated, the American Merino has diverged, are numerous, but may all, perhaps, be classed under three general heads.

The first is a large, short-legged, strong, exceedingly hardy sheep, carrying a heavy fleece, ranging from medium to fine, free from hair in properly bred flocks; somewhat inclined to throatiness, but not so much so as the Rambouillets; bred to exhibit external concrete gum in some flocks, but not commonly so; their wool rather long on back and belly, and ex-

ceedingly dense; wool whiter within than the Rambouillets; skin the same rich rose color. Sheep of this class are larger and stronger than those originally imported, carry much heavier fleeces, and in well-selected flocks, or individuals, the fleece is of a decidedly better quality.

The second class embraces smaller animals than the preceding; less hardy; wool, as a general thing, finer, and covered with a black, pitchy gum, on its extremities; fleece about one-fourth lighter than in the former class.

The third class, bred at the South, mostly, includes animals still smaller and less hardy, and carrying still finer and lighter fleeces. The fleece is destitute of external gum. The sheep and wool have a close resemblance to the Saxon; and, if not actually mixed with that blood, they have been formed into a similar variety, by a similar course of breeding.

The mutton of the Merino, notwithstanding the prejudices existing on the subject, is short-grained, and of good flavor, when killed at a proper age, and weighs from ten to fourteen pounds to the quarter. It is remarkable for its longevity, retaining its teeth, and continuing to breed two or three years longer that the common sheep, and at least half a dozen years longer than the improved English breeds. It should, however, be remarked, in this connection, that it is correspondingly slow in arriving at maturity, as it does not attain its full growth before three years of age; and the ewes, in the best managed flocks, are rarely permitted to breed before they reach that age.

The Merino is a far better breeder than any other fine-woolled sheep, and its lambs, when newly dropped, are claimed to be hardier than the Bakewell, and equally so with the high-bred South-Down. The ewe, as has been intimated, is not so good a nurse, and will not usually do full justice to more than one lamb. Eighty or ninety per cent. is about the ordinary number of lambs reared, though it often reaches one hundred per cent. in carefully managed or small flocks.

Allusion has heretofore been made to the cross between the Merino and native sheep. On the introduction of the Saxon family of the Merinos, they were universally engrafted on the parent stock, and the cross was continued until the Spanish blood was nearly bred out. When the admixture took

place with judiciously selected Saxons, the results were not unfavorable for certain purposes. These instances of judicious crossing were, unfortunately, rare. Fineness of wool was made the only test of excellence, no matter how scanty its quantity, or how diminutive or miserable the carcass. The consequence was, as might be supposed, the ruin of most of the Merino flocks.

Breeding Merinos.—The general principles of breeding cattle and sheep, as laid down by the most approved authorities, must be taken with some exceptions, when applied to the Merino. Good form and breeding qualities are desirable in this breed, but they are not as essential as with others. Wool is the great object, and if this be sufficiently fine, even and abundant, something may be abated in the perfection of form. Early maturity, so much sought after in the mutton sheep, cannot be reconciled with great longevity and the prolonged productive powers of the Merino. We must content ourselves, therefore, with slowly engrafting such improvements on the breed as can be effected without prejudice to his other good qualities, and look to his crosses with others for such qualities as are irreconcilable with his nature. It is considered indispensable to the improvement of the Merino, that it be not bred too young. A vigorous ewe may bring her first lamb at two years old, but it is better that it be deferred till three. The ram should never be used till his second year, and then but sparingly. From two and one-half to six years old is deemed the most vigorous age, though many may be safely used till eight or ten, and occasionally later. Both ewes and rams have been known to breed till twenty years old.

The ram should be large, stout and well made, carrying his weight as compactly as possible. The nose should be convex; the face covered with soft, velvety hair, where not covered with wool; the eye lively and prominent; the veins near the lachrymal glands of a clear red; the horns rough; short neck; pendent dewlap not objectionable; full chest; broad shoulders; broad, level back; large quarters; tail large and well set up; good legs and sound hoofs, with a firm, easy, regular gait; the head carried high, with a look of boldness and decision, without in any degree approaching to wildness or ferocity. The

ewe should possess the characteristics generally, with such modifications as are suited to the sex. Great care should be taken to breed from such as are most perfect in all the essential points of constitution, form and size, and weight, uniformity and fineness of fleece. The closest observation is requisite to select the best in all respects.

Excessive use of rams can never be permitted without de cided injury to them and their progeny. If moderately grained before and during their use, and especially if kept up, and allowed to serve the ewes once only as they come in heat, the number may be largely increased. A vigorous ram will suffice for thirty-five or forty ewes, when running with the flock; yet his powers would not be more taxed by double or even treble this number, if admitted to each but once. If he is gentle, which he should always be, he should be stabled at night and fed with grain. If young ewes have stolen lambs, they should be taken away from them immediately after yeaning, and the nourishment supplied to the lamb by another ewe, or the milk of a cow. The tax of nursing is nearly equal to that of gestation, and further injury to the dam may be avoided by this practice. Merino ewes have had the reputation of being indifferent nurses in Spain. This is owing to their fatigue in traveling, and frequently to scanty pasturage, instead of any constitutional deficiency. It is a frequent practice there to kill a part of the lambs and put one on to two ewes. This has never been found necessary in the countries where they have been transplanted, as generous feed for the dams has invariably been found entirely adequate for their support of the young.

The Saxon.—This, like some others, is one of the varieties of the pure bred Merino, the foundation of which was laid by an importation of some of the choicest animals into Saxony, in 1765. The great care and attention bestowed upon these sheep by the Elector, the nobility and the most intelligent farmers, soon carried them to a point of uniformity and excellence of fleece, never exceeded by the best of the original flocks. The breeders were selected with almost exclusive reference to the quality of the fleece. Great care was taken to prevent exposure throughout the year, and they were housed

on every slight emergency. The consequence of this course of breeding and treatment has been to reduce the size and weight of fleece, and partially to impair that hardiness and vigor of constitution which universally characterized the original Transhumantes. In numerous instances, this management resulted in permanent injury to the character of their flocks, which America has severely felt in several importations of worthless animals, which a too great eagerness for improvement induced her flock-masters to use with the Spanish Merinos and their descendants, as a means for this object but which has resulted in the introduction of fatal diseases and serious deterioration in their flocks.

The New Leicester.—The unimproved Leicester was a large, heavy, coarse-wooled breed of sheep, inhabiting the midland counties of England. It was a slow feeder, its flesh coarse-grained, and with little flavor. The breeders of that period regarded only size and weight of fleece.

The improved Leicester is of large size, but somewhat smaller than the original stock, and in this respect falls considerably below the coarser varieties of Cotswold, Lincoln, etc. When there is sufficiency of feed, the new Leicester is unrivaled for its fattening propensities; but it will not bear hard stocking, nor must it be compelled to travel far in search of its food, It is, in fact, properly and exclusively a lowland sheep. In its appropriate situation—on the luxuriant herbage of the highly cultivated lands of England—it possesses unequalled earliness of maturity; and its mutton, when not too fat, is of a good quality, but is usually coarse, and comparitively deficient in flavor, owing to that unnatural state of fatness which it so readily assumes, and which the breeder, to gain weight, so generally feeds for. The wethers, having reached their second year, are turned off in the succeeding February or March, and weigh at that age from thirty to thirty-five pounds to the quarter. The wool of the New Leicester is long, averaging, after the first shearing, about six inches; and the fleece of the American animal weighs about six pounds. It is of a coarse quality, and little used in the manufacture of cloth, on account of its length, and that deficiency of felting properties common, in a greater or less extent, to all English breeds. As a comb-

ing wool, however, it stands first, and is used in the manufacture of the finest worsteds, and the like textures.

In England, where mutton is generally eaten by the laboring classes, the meat of this variety is in very great demand; and the consequent return which a sheep possessing such fine feeding qualities is enabled to make renders it a general favorite with the breeder. Instances are recorded of the most extraordinary prices having been paid for these animals. They have spread into all parts of the British dominions, and been imported into the other countries of Europe and into the United States. The breed, however, has never proved a favorite with any large class of American farmers. Our long, cold winters—but, more especially, our dry, scorching summers, when it is often difficult to obtain the rich, green, tender feed in which the Leicester delights—together with the general deprivation of green food in the winter, rob it of its early maturity, and even of the ultimate size which it attains in England. Its mutton is too fat, and the fat and lean are too little intermixed to suit American taste. Its wool is not very salable, owing to the dearth of worsted manufactures in our country. Its early decay and loss of wool constitute an objection to it, in a country where it is often so difficult to advantageously turn off sheep, particularly ewes. But, notwithstanding all these disadvantages, on rich, lowland farms, in the vicinity of considerable markets, it will always, in all probability, make a profitable return.

The head of the New Leicester should be hornless, long, small, tapering towards the muzzle, and projecting horizontally forward; the eyes prominent, but with a quiet expression; the ears thin, rather long, and directed backward; the neck full and broad at its base, where it proceeds from the chest, so that there is, with the slightest possible deviation, one continued horizontal line from the rump to the poll; the breast broad and full; the shoulders also broad and round, and no uneven or angular formation where the shoulders join with the neck or the back—particularly no rising of the withers, or hollow behind the situation of these bones; the arm fleshy throughout its whole extent, and even down to the knee; the bones of the leg small, standing wide apart; no looseness of skin about them,

and comparitively void of wool; the chest and barrel at once deep and round; the ribs forming a considerable arch from the spine, so as, in some cases—and especially when the animal is in good condition—to make the apparent width of the chest even greater than the depth; the barrel ribbed well home; no irregularity of line on the back or belly, but on the sides; the carcass very gradually diminishing in width towards the rump; the quarters long and full, and, as with the fore-legs, the muscles extending down to the hock; the thighs also wide and full; the legs of a moderate length; and the pelt almost moderately thin, but soft and elastic, and covered with a good quantity of white wool, not so long as in some breeds, but considerably finer.

The South-Down.—A long range of chalky hills, diverging from the chalky stratum which intersects England from Norfolk to Dorchester, is termed the South-Downs. On these downs a certain breed of sheep has been produced for many centuries, in greater perfection than elsewhere; and hence have sprung those successive colonies which have found their way abroad and materially benefited the breed of short-woolled sheep wherever they have gone. It is only, however, within a comparatively recent period that they have been brought to their present perfection. As recently as 1776, they were small in size, and of a form not superior to the common woolled sheep of the United States; they were far from possessing a good shape, being long and thin in the neck, high on the shoulders, low behind, high on the loins, down on the rump, the tail set on very low, perpendicular from the hip bones, sharp on the back; the ribs flat, not bowing, narrow in the fore-quarters, but good in the leg, although having big bones. Since that period a course of judicious breeding has mainly contributed to raise this variety to its present value; and that, too, without the admixture of the slightest degree of foreign blood.

This pure, improved family, it will be borne in mind, is spoken of in the present connection; inasmuch as the original stock, presenting, with trifling modifications, the same characteristics which they exhibited seventy-five years ago, are yet to be found in England; and the intermediate space between these two classes is occupied by a variety of grades, rising on

falling in value, as they approximate to or recede from the improved blood.

The South-Down sheep are polled, but it is probable that the original breed was horned, as it is not unusual to find among the male South-Down lambs some with small horns. The dusky, or at times, black hue, of the head and legs fully establishes the original color of the sheep, and, perhaps of all sheep; while the later period at which it was seriously attempted to get rid of this dingy hue proving unsuccessful, only confirms this view. Many of the lambs have been dropped entirely black.

It is an upland sheep, of medium size, and its wool—which in point of length belongs to the middle class, and differs essentially from Merino wool of any grade, though the fibre in some of the finest fleeces may be of the same apparent fineness with half or one-quarter blood Merino—is deficient in felting properties, making a fuzzy, hairy cloth, and is no longer used in England; unless largely mixed with the foreign wool, even for the lowest class of cloths. As it has deteriorated, however, it has increased in length of staple, in that country, to such an extent that improved machinery enables it to be used as a combing-wool, for the manufacture of worsteds. Where this has taken place it is quite as profitable as when it was finer and shorter. In the United States, where the demand for combing-wool is so small that it is easily met by a better article, the same result would not probably follow. Indeed, it may well be doubted whether the proper combing length will be easily reached, or at least maintained in this country, in the absence of that high feeding system which has undoubtedly given the wool its increased length in England. The average weight of fleece in the hill-fed sheep is three pounds; on rich lowlands, a little more.

The South-Down, however, is cultivated more particularly for its mutton, which for quality takes precedence of all other—from sheep of good size—in the English markets. Its early maturity and extreme aptitude to lay on flesh, render it peculiarly valuable for this purpose. It is turned off at the age of two years, and its weight at that age is, in England, from eighty to one hundred pounds. High-fed wethers have reached from

thirty-two to even forty pounds a quarter. Notwithstanding its weight, it has a patience of occasional short keep, and an endurance of hard stocking, equal to any other sheep. This gives it a decided advantage over the bulkier Leicesters and Lincolns, as a mutton sheep, in hilly districts, and those producing short and scanty herbage. It is hardy and healthy, though, in common with the other English varieties, much subject to catarrh, and no sheep better withstands our American winters. The ewes are prolific breeders and good nurses.

The Down is quiet and docile in its habits, and, though an industrious feeder, exhibits but little disposition to rove. Like the Leicester, it is comparatively a short-lived animal, and the fleece continues to decrease in weight after it reaches maturity. It crosses better with short and middle-woolled breeds than the Leicester. A sheep possessing such qualities, must, of necessity, be valuable in upland districts in the vicinity of markets. The desirable characteristics of the South-Down may be thus summed up: The head small and hornless; the face speckled or gray, and neither too long nor too short; the lips thin, and the space between the nose and the eyes narrow; the under jaw or chop fine and thin; the ears tolerably wide and well covered with wool, and the forehead also, and the whole space between the ears well protected by it, as a defence against the fly; the eye full and bright, but not prominent; the orbits of the eye, the eye-cap or bone not too projecting, that it may not form a fatal obstacle in lambing; the neck of a medium length, thin toward the head, but enlarging toward the shoulders, where it should be broad and high and straight in its whole course above and below.

The breast should be wide, deep and projecting forward between the fore-legs, indicating a good constitution and a disposition to thrive; corresponding with this, the shoulders should be on a level with the back, and not too wide above; they should bow outward from the top to the breast, indicating a springing rib beneath, and leaving room for it; the ribs coming out horizontally from the spine, and extending far backward, and the last rib projecting more than others; the back flat from the shoulders to the setting on of the tail; the loin broad and flat; the rump broad, and the tail set on high, and nearly on a level with the spine

The hips should be wide; the space between them and the last rib on each side as narrow as possible, and the ribs generally presenting a circular form like a barrel; the belly as straight as the back; the legs neither too long nor too short; the fore-legs straight from the breast to the foot, not bending inward at the knee, and standing far apart, both before and behind; the hock having a direction rather outward, and the twist, or the meeting of the thighs behind, being particularly full; the bones fine, yet having no appearance of weakness, and of a speckled or dark color; the belly well defended with wool, and the wool coming down before and behind to the knee and to the hock; the wool short, close, curled and fine, and free from spiry projecting fibres.

The Cotswold.—The Cotswolds, until improved by modern crosses, were a very large, coarse, long-legged, flat-ribbed, variety, light in the fore quarter, and shearing a long, heavy, coarse fleece of wool. They have been extensively crossed with the Leicester sheep—producing thus the modern or improved Cotswold—by which their size and fleece have been somewhat diminished, but their carcasses have been materially improved, and their maturity rendered earlier. The wethers are sometimes fattened at fourteen months old, when they weigh from fifteen to twenty-four pounds to a quarter, and, at two years old, increase to twenty or thirty pounds.

The wool is strong, mellow, and of good color, though rather coarse, six to eight inches in length, and from seven to eight pounds per fleece. The superior hardihood of the improved Cotswold over the Leicester, and their adaptation to common treatment, together with the prolific nature of the ewes, and their abundance of milk, have rendered them in many places rivals of the New Leicester, and have obtained for them, of late years, more attention to their selection and general treatment, under which management still farther improvement has been made. They have also been used in crossing other breeds, and have been mixed with the Hampshire Downs. Indeed, the improved Cotswold, under the name of the New, or Improved Oxfordshire sheep, have frequently been the successful candidates for prizes offered for the best long-wooled sheep at some of the principal agricultural meetings or shows

in England. The quality of their mutton is considered superior to that of the Leicester; the tallow being less abundant, with a larger development of muscle or flesh.

The degree to which the cross between the Cotswold and Leicester may be carried, must depend upon the nature of the old stock, and on the situation and character of the farm. In exposed situations, and somewhat scanty pasture, the old blood should decidedly prevail. On a more sheltered soil, and on land that will bear closer stocking, a greater use may be made of the Leicester. Another circumstance that should guide the farmer is the object which he has principally in view. If he expects to derive his chief profits from the wool, he will look to the primitive Cotswolds; if he expects to gain more as a grazier, he will use the Leicester ram more freely.

The Cheviot.—On the steep, storm-lashed Cheviot hills, in the extreme north of England, this breed first attracted notice for their great hardiness in resisting cold, and for feeding on coarse, heathery herbage. A cross with the Leicester, pretty generally resorted to, constitutes the improved variety.

The Cheviot readily amalgamates with the Leicester—the rams employed in the system of breeding, which has been extensively introduced for producing the first cross of this descent, being of the pure Leicester breed—and the progeny is superior in size, weight of wool, and tendency to fatten, to the native Chevoit. The benefit, however, may be said to end with the first cross, and the progeny of this mixed descent is greatly inferior to the pure Leicester in form and fattening properties, and to the pure Cheviot in hardiness of constitution.

The improved Cheviot has greatly extended itself throughout the mountains of Scotland, and in many instances supplanted the black-faced breed; but the change, though often advantageous, has in some cases been otherwise—the latter being somewhat hardier, and more capable of subsisting on heathy pasturage. They are a hardy race, however, well suited for their native pastures, bearing, with comparative impunity, the storms of winter, and thriving well on poor keep. The purest specimens are to be found on the Scotch side of the Cheviot hills, and on the high and stony mountain farms which lie between that range and the sources of the Teviot. These

sheep are a capital mountain stock, provided the pasture resembles those hills, in containing a good proportion of rich herbage. Though less hardy than the black-faced sheep of Scotland, they are more profitable as respects their feeding, making more flesh on an equal quantity of food, and making it more quickly.

They have white faces and legs, open countenances, lively eyes, and are without horns; the ears are large, and somewhat singular, and there is much space between the ears and eyes; the carcass is long; the back straight; the shoulders rather light; the ribs circular; and the quarters good. The legs are small in the bone, and covered with wool, as well as the body, with the exception of the face. The wether is fit for the butcher at three years old, and averages from twelve to eighteen pounds a quarter, the mutton being of a good quality, though inferior to the Southdown, and of less flavor than the black-faced. The Cheviot, though a mountain breed, is quiet and docile, and easily managed.

The wool is about the quality of Leicester, coarse and long, suitable only for the manufacture of low coatings and flushings. It closely covers the body, assisting much in preserving it from the effects of wet and cold. The fleece averages about three and a half pounds. Formerly the wool was extensively employed in making cloths; but, having given place to the finer Saxony wools, it has sunk in price, and been confined to combing purposes. It has thus become altogether a secondary consideration. The Cheviots have become an American sheep by their repeated importations into this country.

The Lincoln.—The old breed of Lincolnshire sheep was hornless, had white faces, and long, thin, and weak carcasses; the ewes weighed from fourteen to twenty pounds a quarter; the three-year old wethers from twenty to thirty pounds; legs thick, rough and white; pelts thick; wool long—from ten to eighteen inches—and covering a slow-feeding, coarse-grained carcass of mutton. The improved Lincolns possess a rather more desirable robustness, approaching, in some few specimens, almost to coarseness, as compared with the finest Leicesters; but they are more hardy and less liable to disease.

The Age.—The age of sheep is usually reckoned, not from the time they are dropped, but from the first shearing; although the first year may thus include fifteen or sixteen months, and sometimes more When doubt exists relative to the age, recourse is had to the teeth, since there is more uncertainty about the horn in this animal than in cattle; ewes that have been early bred, appearing always, according to the rings on the horn, a year older than others that have been long kept from the ram.

The Teeth.—Sheep have no teeth in the upper jaw, but the bars or ridges of the palate thicken as they approach the fore part of the mouth; there, also, the dense, fibrous, elastic matter, of which they are constituted, becomes condensed, and forms a cushion or bed, which covers the converse extremity of the upper jaw, and occupies the place of the upper incisor, or cutting teeth, and partially discharge their functions. The herbage is firmly held between the front teeth in the lower jaw and this pad, and thus partly bitten and partly torn asunder. Of this, the rolling motion of the head is sufficient proof.

The teeth are the same in number as in the mouth of the ox. There are eight incisors or cutting teeth in the fore part of the lower jaw, and six molars in each jaw above and below, and on either side. The incisors are more admirably formed for grazing than in the ox. The sheep lives closer, and is destined to follow the ox, and gather nourishment where that animal would be unable to crop a single blade. This close life not only loosens the roots of the grass, and disposes them to spread, but by cutting off the short suckers and sproutings —a wise provision of nature—causes the plants to throw out fresh, and more numerous, and stronger ones, and thus is instrumental in improving and in increasing the value of the crop. Nothing will more expeditiously and more effectually make a thick, permanent pasture than its being occasionally and closely eaten down by sheep.

The mouth of the lamb newly dropped is either without incisor teeth or it has two. The teeth rapidly succeed to each other, and before the animal is a month old he has the whole of the eight. They continue to grow with his growth until he

is about fourteen or sixteen months old. Then with the same previous process of dimunition as in cattle, or carried to a still greater degree, the two central teeth are shed, and attain their full growth when the sheep is two years old.

In examining a flock of sheep, however, there will often be very considerable difference in the teeth of those that have not been sheared, or those that have been once sheared; in some measure to be accounted for by a difference in the time of lambing, and likewise in the general health and vigor of the animal. There will also be a material difference in different animals, attributable to the good or bad keep which they have had. Those fed on good land, or otherwise well kept, will generally take the start of others that have been half starved, and renew their teeth some months sooner than these. There are also irregularities in the times of renewing the teeth, not to be accounted for by either of these circumstances; in fact, nor to be explained by any known circumstance relating to the breed or the keep of the sheep. The want of improvement in sheep, which is occasionally observed, and which cannot be accounted for by any deficiency or change of food, may sometimes be justly attributed to the tenderness of the mouth when the permanent teeth are protruding through the gums.

Between two and three years old the next two incisors are shed; and, when the sheep is actually three years old, the four central teeth are fully grown; at four years old, he has six teeth fully grown; and at five years old—one year before the horse or the ox can be said to be full-mouthed—all the teeth are perfectly developed. The Sheep is a much shorter lived animal than the horse, and does not often attain the usual age of the ox. Their natural age is about ten years, to which age they will breed and thrive well; though there are recorded instances of their breeding at the age of fifteen, and of living twenty years.

The careless examiner may be sometimes deceived with regard to the four-year-old mouth. He will see the teeth perfectly developed, no diminutive ones at the sides, and the mouth apparently full; and then, without giving himself the trouble of counting the teeth, he will conclude that the animal is five years old. A process of displacement, as well as of

diminution, has taken place here; the remaining outside milk-teeth have not only shrunk to less than a fourth part of their original size, but the four-year-old teeth have grown before them and perfectly concealed them, unless the mouth is completely opened.

After the permanent teeth have all appeared and are fully grown, there is no criterion as to the age of the sheep. In most cases, the teeth remain sound for one or two years, and then, at uncertain intervals—either on account of the hard work in which they have been employed, or from the natural effect of age—they begin to loosen and fall out; or, by reason of their natural slenderness, they are broken off. When favorite ewes, that have been kept for breeding, begin to lose condition, at six or seven years old, their mouths should be carefully examined. If any of the teeth are loose, they should be extracted, and a chance given to the animal to show how far, by browsing early and late, she may be able to make up for the diminished number of her incisors. It frequently happens that ewes with broken teeth, and some with all the incisors gone, will keep pace in condition with the best in the flock; but they must be well taken care of in the winter, and, indeed, nursed to an extent that would scarcely answer the farmer's purpose to adopt as a general rule, in order to prevent them from declining to such a degree as would make it very difficult afterward to fatten them for the butcher. It may certainly be taken as a general rule that when sheep become broken-mouthed they begin to decline.

Causes of which the farmer is utterly ignorant, or over which he has no control, will sometimes hasten the loss of the teeth. One thing, however, is certain—that close feeding, causing additional exercise, does wear them down; and that the sheep of farmers who stock unusually and unseasonably hard, lose their teeth much sooner than others do.

The following is Professor Symonds' statement of the dentition of the sheep as indicative of age:

DENTITION OF THE SHEEP.

Table of Early Dentition.			Table of Late Dentition.		
Yrs.	Months.		Yrs.	Months.	
1	0	Central pair of temporary incisors replaced by permanent.	1	3	Two permanent incisors.
1	6	Second pair "	2	0	Four "
2	3	Third pair "	2	6	Six "
3	0	Fourth pair "	2	9	Eight "

Breeding.—In the management of sheep, how to procure the most profit from the flock, is the greatest consideration. It is not exactly how to increase the flock most rapidly, nor to produce the heaviest carcasses or fleeces, but to produce such animals as will return the most money for the expenditure and labor involved. In some localities the sale of an early lamb will bring in more money than that of the mother with its fleece. Where there is a market for lambs, it is evidently the most profitable to keep such sheep, and to keep them in such a way as will produce the highest priced lambs. Where mutton is the most profitable, there a different management must be adopted, and frequently a different breed of sheep must be kept. Where wool only is the object, still another different course will be chosen. Whichever end is to be gained, the care of the breeding ewes and the lambs will be a subject of much solicitude. But what would be a proper course in one case would not be at all proper in another. A few general principles are involved in the management of ewes and lambs, which will first be explained, after which the special management proper to be adopted for each special case will be considered.

The period of gestation of the ewe is 150 to 153 days. Five months, in round numbers, may be taken as the period during which the ewe carries a lamb. The coupling of the ewes and rams should be so timed that the lamb may be dropped at the most desirable season. It will be found a great convenience to mark the rams and ewes, or such of them as may be selected to breed stock animals from. Where a small flock only is kept, or where special care is given to the improvement of the breed, every sheep should be marked by a number, that the time of its coupling may be noted and the date of the expected birth

of the lamb be known. The best method of marking is by means of metallic ear marks, inserted in the ear in different ways, to distinguish the sexes easily.

A ewe that produces a fine, large, active lamb, that is a good nurse, and that rears a profitable market lamb, or that rears twins successfully, is a valuable animal to retain in the flock so long as she remains productive. Such ewes have been kept until 10 or 12, or even 16, years old, and to be able to identify a ewe of this kind is very necessary when the greatest profit is the object sought, and more especially in those cases when the special business is to rear market lambs or increase the flock rapidly. No more than 30 ewes should be apportioned to one ram in any season, unless he be a full grown one and in vigorous health, and it would be well to observe the rules laid down for the management of the ram at this season. If the ram is equal to the work, 50 ewes may be given to him, but it is better to err on the safe side in this matter, as overwork simply means barren ewes and loss of lambs. At the breeding season the ram should be smeared upon the brisket every day with a mixture of raw linseed oil and red ocher, so that he will leave a mark upon each ewe that may be served. As the ewes are served they are to be drafted from the flock and placed in a field or yard by themselves. Two rams should not be kept together in a small breeding flock, as quarreling and fighting are certain to result and great damage may occur. If two rams are necessary, each may be used on alternate days. Wethers are a nuisance in a flock of ewes at this season, disturbing them and keeping them and themselves from feeding. A plan followed with advantage where the flock consists of heavy bodied sheep, and where the necessary attention can be given, is to keep the ram in a yard or paddock by himself, out of sight of the ewes, and to allow a wether to run with them. As each ewe comes in season, the wether singles her out and keeps company with her. On the return of the flock from the pasture at night, the ewe or ewes in season are turned in to the ram until they are served, when they may be removed at once, or left with him until the morning. In the morning, if any ewes have come into heat during the night, they may be served before the flock is turned into pasture. This is continued

until it is known that all the ewes are in lamb. By this method a ram may be made to serve double the number of ewes that he would if allowed indiscriminate access to them, and exhaust himself in useless and repeated exertions.

As soon as the ewes have been served, the time of each is entered in the record. They are carefully preserved from all worry by dogs and needless driving and handling. Peace and quietness at this season will tend to the production of quiet and, docile lambs. The shepherd should make himself very familiar with them, and by giving salt or meal in the hand, or a small dish, reduce them to a condition of perfect docility. Any ewes that have either refused the ram or have failed to breed, should be dosed with two ounces of epsom salts and be stinted in their feed for a few days to reduce their condition. This will generally be effective in bringing them into season. Good fair condition is better than an excess of fat, but ewes in poor condition cannot be expected to produce other than poor, weak lambs; neither will an excessively fat ewe produce a strong lamb. Some extra food will now be needed by the ewes, and should be given at first in small quantities. Bran, crushed malt, and crushed oats and corn mixed, are the best kinds of food. Oil-cake, either of cotton-seed or linseed, unless used with great caution, is not always healthful food for ewes in lamb. Any food that actively affects the bowels, either way, is to be avoided. Half a pint a day may be given of the first mentioned foods, and a change from one to another may be frequently made. So long as pasture is to be had, this allowance will be sufficient. When the winter feeding commences, the ration of grain should be gradually increased until, at the period when lambing time approaches, a pint daily is given. Cold watery food is highly dangerous at this time, and roots should not be given in large quantities, nor at all, unless pulped and mixed with cut hay and the grain. Turnips or other roots that have been highly manured with superphosphate of lime has been said by several experienced English breeders to be productive of abortion. Water should be given in small and frequent quantities. It is best to have running water or water from a well always at hand for the ewes. If the ewes have not heretofore been kept apart from the rest of the flock,

they should now be separated. The general treatment of ewes up to this time should be such as will keep them free from all excitement, and in good, healthful condition. The record should now be consulted, and as the ewes near their time they should be removed into a part of the stables or sheep-barn, where each one can have a small pen to herself. These pens should be made so that light can be shut out if desired. Here they are permitted to drop their lambs in perfect quiet; by this means few ewes will disown their lambs, and no lambs will be lost by creeping into feed racks or out-of-the-way places. The pens should not be larger than 5x4 feet.

The Lamb.—As soon as the lamb is dropped and the ewe has owned and licked it, and the lamb has once sucked, all danger, except from gross carelessness, is passed. The ewe will be greatly helped by a drink of slightly warm, thin oatmeal gruel well salted. The lamb will be benefitted by a teaspoonful of castor oil given in new milk, if the first evacuations do not pass away freely. These are apt to be very glutinous and sticky, and, by adhering to the wool, to close the bowel completely unless removed. Warm water should be used to soften and remove these accumulations. The anus and surrounding wool should then be smeared with pure castor oil. If the lamb is not sufficiently strong to reach the teats, and suck, it should be assisted once or twice. Any locks of wool upon the ewe's udder, that may be in the way, should be clipped. If the lamb is scoured, a teaspoonful of a mixture of one pint of peppermint water and one ounce of prepared chalk should be given every three hours, until it is relieved. When the ewe refuses to own the lamb, she may be confined between two small hurdles. Two light stakes are driven in the ground close together to confine the ewe's head and keep her from butting the lamb. If she is disposed to lie down, as some obstinate ones will do, a light pole is passed through the hurdles resting upon the lower bar, beneath her belly. Thus confined during the day, she is helpless, and, if the lamb is lively, it will manage to get its supply of food. The ewe should be released at night. One day's confinement is often sufficient to bring an obstinate ewe to reason.

A twin lamb, or one deprived of its dam, that may need to

be reared by hand, may easily be fed upon cow's milk. A fresh cow's milk is the best fitted for this purpose. Ewe's milk is richer in solid matter than that of the cow, and the addition of a teaspoonful of white refined sugar to the pint of cow's milk will make it more palatable to the lamb. At first not more than a quarter of a pint of milk should be given at once. The milk should be freshly drawn from the cow and warmed up to 100 degrees before it is fed. A convenient method of feeding milk to a lamb is to use a small tin can with a long spout, such as is used for oil. An air-hole is punched in the cover or cork and a piece of sponge covered with a cloth is tied upon the end of the spout. The flow is thus made easy and equal, and the lamb sucks in a natural manner. A very short time is sufficient to familiarize the lamb with this kind of foster mother. To encourage the flow of milk in the ewe and the corresponding growth of the lambs, the food of the ewes should be of the best character. Clover hay, bran, and crushed oats, with some pea-meal, are the most preferable foods, producing a rich milk in abundance. The ewes must not be allowed to fall off in condition, or the lambs will fail. During mild weather, sugar beets may be given in moderate quantity with advantage, but mangels or Swede turnips (rutabagas) should be avoided, as too watery and deficient in nutriment, and productive of scours in the lamb. In cold weather roots are apt to reduce the temperature of the animal too suddenly if given in any but small quantities, and consequently decrease the flow of milk. Pea straw is a favorite and nutritious food for sheep, but it will be found profitable to give only the very best at hand to nursing ewes. The after growth and condition of the lambs will greatly depend upon the maintenance of a thrifty and continuous growth during the first three months of their existence.

Docking and Castrating.—At the age of a week the operations of docking and castrating the male lambs, may be safely performed. At this age the young animal suffers but little, there is no loss of blood, and the wounds heal by the first intention. The rough and ready method of clipping off the tail an inch from the rump, first drawing the skin upwards, and of clipping off the scrotum and testicles altogether with a pair of sharp sheep-shears, will be found perfectly safe if done before

the lamb is two weeks old. The nerves being very slightly sensitive at this time, the painful, and, when later performed, dangerous operation of emasculation is only slightly felt, and within an hour a lamb bereft of tail and generative organs will frequently be seen skipping playfully in the sunshine. To dock an older lamb is a more troublesome operation. To do this with facility, a block of wood, about a foot high, a sharp, broad chisel, and a wooden mallet, are required. The operator stoops with bended knees, the block being in front of him, takes the lamb with its head between his knees and its tail in his left hand, holding the chisel in his right hand. Backing the lamb's rump up close to the block, he lays the tail upon it, and, drawing back the skin of the tail up to the rump, holds the chisel lightly upon the tail, close to and below the fingers of the left hand. When all is ready he directs an assistant to strike the chisel smartly with the mallet, by which the tail is instantly severed about two inches from the root. A pinch of powdered bluestone (sulphate of copper) is placed on the wound and the lamb is released. To castrate an old lamb with safety, the scrotum should be opened by a long, free incision with a sharp knife at the lower point, the animal being at the time turned upon its back and secured in that position. The scrotum should be held in the hand tightly enough to keep the skin tense. The cut should be made only through the skin and coats of the testicle, and not into the gland, by which a great deal of pain is spared to the animal. The gland will escape from the scrotum at once if the opening is made large enough. It may be taken in the left hand and the cord and vessels scraped apart, not cut, by which bleeding is prevented and healing made more certain and rapid. The opening being made at the bottom of the scrotum, allows the blood and any pus that forms in the wound, to escape freely. It might probably be beneficial to insert a small plug of tow in the wound, projecting out of it a short distance to prevent the edges from healing until the inflammation has subsided. This method of operation is a safe one, and, if it is neatly done, the losses need not be one per cent., while frequently three lambs out of five may be lost by any other method.

Additional Food.—While the lambs are still with the

ewes, and although the ewes may be well fed with a special view to the thriftiness of the lambs, yet a supply of additional food for the latter will be of great advantage to them. To furnish a young animal with all the food that it can digest, and that of the choicest character, is to create a sturdy, thrifty, strong constitutioned animal that will be prolific in reproduction and long lived. To advance the maturity of an animal is also to lengthen its life, for it matters not at which part of its productive career we add a year, it certainly, so far as profit is concerned, lives a year longer for us. If a yearling ewe can be made to produce a healthful, strong lamb, or a lamb can be brought by care to maturity for the market at eighteen months instead of thirty months, this result is simply equal to a profit of 40 per cent. And feed is the agent by which this profit is secured, of course made available by proper care in selecting the breeding stock. To provide the means whereby the lambs may procure the extra feed needed for their rapid development, many contrivances have been brought into use. Generally these are modifications of the plan of providing a pen or yard adjoining that in which the ewes are kept, with "creep holes" in the fence through which the lambs can gain access to it. In this yard some feed, consisting of oats, rye, wheat bran ground together very finely, is placed in troughs or boxes, and lightly salted. They will soon find this, and will resort to it several times a day. But, by whatever means it may be done, the lamb should be supplied with some additional concentrated and nutritious feed. As a gentle laxative in case of constipation, a few ounces of linseed oil-cake-meal will be found sufficient, and far better than physic. Linseed oil (raw), or castor oil, a teaspoonful of either at a dose, will be found safe and effective for either constipation or diarrhœa, unless of a serious character.

Weaning.—As lambs progress toward the period for weaning, the extra food should be gradually increased, unless they can be removed to a good pasture of short, tender grass. In this case even a small allowance at night, on their return to the fold, will be beneficial. The weaning should be very gradually done. The sudden removal of the lambs from their dams is injurious to both. It too abruptly deprives the lambs of their most easily digested and most agreeable food. It forces them

to load the stomach with food for which it is hardly yet prepared, and suddenly arrests their growth both by a stinting of food and by the nervous irritation consequent upon their sudden deprivation. The dams in full flow of milk, thus at once deprived of the means of relief, are subjected to the engorgement of the udder, with the consequent congestion of all the organs connected therewith. This shock is very injurious, and frequently produces inflammatory disorders of the blood or garget. To avoid these ill effects of the sudden change, it is well to remove the lambs to a distant pasture, along with some dry ewes or wethers for company. The novel experience of a fresh pasture will cause them to forget their dams, and they will utter no complaints nor manifest any uneasiness. At night they should be turned into the fold with ewes, whose full udders they will speedily relieve. By withdrawing any extra feed hitherto given to the ewes, somewhat gradually (in no case is it wise to make a sudden change in the management of sheep) their supply of milk will gradually decrease, and in two weeks the whole of the lambs may be weaned with perfect safety to themselves and the ewes.

After having been weaned, the lambs should have the first choice of pasture and the best and tenderest cuttings of the fodder crops. Many farmers have found it advantageous in every way to turn newly weaned lambs into a field of corn in the month of August. The corn is too far grown to be injured, the suckers only will be nibbled by the lambs, and the weeds which grow up after the corn is laid by, will be eaten closely. The lambs also have the benefit of a cool shade, and where such a field can be conveniently applied to this purpose, there are several reasons why it might well be done.

Care of Ewes after Weaning.—The condition of the ewes must not be neglected at this time. The chief danger is in regard to those that are heavy milkers. Such sheep should be closely watched, and the milk drawn by hand from those whose udders are not emptied by the lambs. The first approach to hardness or heat in the udder should be remedied by an immediate dose of an ounce of epsom salts dissolved in water, and mixed with a teaspoonful of ground ginger. The next two days 20 grains of saltpetre should be given each morning and

evening, to increase the action of the kidneys. These remedies will generally relieve the udder, and will tend to greatly reduce the secretion of milk. If hay is given in place of grass, and the ewe confined in a cool, darkened pen, the drying up of the milk will be hastened.

Selection for Breeding.—As the improvement of the flock can be better made from within than by giving the sole attention to bringing new blood from without, it will be very important to select the best lambs, both of rams and ewes, for breeders. The selection should be made chiefly in reference to the purposes for which the flock is kept, and strength of constitution, rapidity of growth, size, tendency to fat; fineness, length or quality of wool, and prolificness and certainty of breeding, in the parents as well as, so far as can be judged of, in the lambs themselves, should be made the tests by which the selection is determined. If the production of early lambs for market is the object, the produce of those ewes which bring single lambs of large size and quick growth will be chosen to increase the flock; if the production of mutton sheep, then those lambs from ewes which drop twins, and are good nurses, ought to be kept; and if wool of any particular kind is desired, then the selection should be made chiefly in reference to that. On no account should weakly lambs, or those ewes which are poor nurses, or fail to breed, or which exhibit tenderness of constitution, or are wanderers, or of uneasy, restless dispositions, be retained; but such unprofitable animals should be closely weeded out and fattened for sale or for slaughter. The choice of ram lambs is of chief importance; for the influence of the ram runs through the flock, while that of the ewe is confined to her produce alone. To select a lamb for a stock ram is a matter requiring a knowledge of the principles of breeding, and some tact and experience. The latter qualifications cannot be acquired from books, but must be gained by practice.

Winter Management and Food.—Sheep should be brought into winter quarters soon after the severe frosts occur, as these diminish the feed and materially impair its nutritious qualities. They ought also to be removed from the grass lands before they become permanently softened by the rains, as they will injuriously affect their comfort and health; and it is equally

objectionable from their poaching the sod. If the number be large when brought to the yards, they must be carefully divided into flocks of one hundred or less, according to the size of the yards and sheds. The young and feeble must be separated from the others, and the ailing ones placed by themselves, and that no one may suffer from the others, all should be classed as uniformly as possible, as to strength. The yards must be dry, well supplied with a trough of fresh water, and with comfortable sheds to which they can retire when they choose. In snowy winters, if water be not handy, snow will supply its place quite well.

Shelters.—These in northern climates are indispensable to profitable sheep raising, and, in every latitude north of the Gulf of Mexico, they would be advantageous. There is policy as well as humanity in the practice. An animal eats much less when thus protected; he is more thrifty, less liable to disease, and his manure is richer and more abundant. The feeding may be done in the open yard in clear weather, and under cover in severe storms. The shelters for sheep are variously constructed, to suit the taste or circumstance of the flock-master. Sheep barns built upon a side hill will afford underground floors, surrounded by three sides of wall, and opening to the south, with sliding or swinging doors to guard against storms, and sufficient storage for the fodder may be made by scaffolds; or they may be constructed with twelve or fifteen feet posts, on level ground, allowing them to occupy the lower part, with the fodder stored above. In all cases, however, thorough ventilation should be provided, for of the two evils, of exposure to cold or too great privation of air, the former is to be preferred. Sheep cannot long endure close confinement without injury. In all ordinary weather, a shed, closely boarded on three sides, with a close roof, is sufficient protection, especially if the open side is shielded from bleak winds, or leads into a well enclosed yard. If the apartment above is used for storage, the floors should be made tight, that no hay, chaff or dust can fall upon the fleece.

FIG. 2.—SHEEP BARN.

A building which is well arranged and convenient is shown in figures 2, 3, and 4. It consists of a barn, shown at figure 2, about 20 feet wide, 16 feet high from basement to eaves, and as long as desirable. This is intended to store the hay or fodder. The posts, sills, and plates are all 8 inches square, the girts and braces are 4 inches square, the beams 2 x 10, are placed 16 inches apart, and are cross-bridged with strips 3 inches wide. The hay is piled inside, so that the feed passage below, over which there are trap-doors, is left uncovered. The hay is thrown down through these doors, and falls upon a sloping shelf, which carries it into the feed racks below. (See figure 3). The basement under the barn is 8 feet high, and is of stone on three sides; the front is supported by posts 8 inches square, and 8 feet apart. Be-

FIG. 3.—SECTION OF BUILDING.

FIG. 4.—HANGING DOOR FOR BARN.

tween each pair of posts a door is hung upon pins (figure 4), which fit into grooves in the posts, so that the door may be raised and fastened in such a manner as to close the upper half of the space between the posts; or be held suspended half way, leaving the whole open; or be shut down and close the lower half; or be removed altogether. By this contrivance at least half the front of the basement must be left open, whether the sheep be shut in or out. The floor of the basement should be slightly sloping from rear to front, so that it will always be dry. Figure 3 gives a section of the whole barn. The hay-loft is above, and the passage-way and the doors, by which the hay is thrown down to the feed-racks below; as well as the sloping shelf by which the hay is carried into the feed-racks are shown.

Below the feed-rack is the feed-trough for roots or meal. A door shuts off this trough from the sheep at the front, while the feed is being prepared, and, when it is ready, the door is raised, and held up to the feed-rack by a strap or a hook. The feed-rack is closely boarded behind, and this back part, which is in the feed-passage, slopes forward to the front, so as to carry the hay forward to the bottom. The front of the rack is of upright slats, smoothly dressed, two inches wide, and placed three inches apart. The boards of the feed-trough are smoothly dressed and sand-papered, and all the edges are rounded, so that there is nothing by which the wool may be torn or rubbed off from the sheep's necks. It will be seen by this arrangement that there is no dangerous thing by which a sheep or a lamb might be hurt, nor a place where it can get into mischief. The root-cellar is at the rear of the basement, and is reached by the stairs already mentioned.

Racks or Mangers.—Racks and mangers are indispensable to economical feeding. If the hay is fed on the ground, the leaves and seeds, the most valuable part of the fodder, are almost wholly lost, and, when wet, the sheep, in their restlessness while feeding, will tread much of it into the mud. To make an economical box or rack, take six light pieces of scantling, say three inches square, one for each corner, and one for the center of each side. Boards of pine or hemlock, twelve or fifteen feet long and twelve or fourteen inches wide, may

then be nailed on to the bottom of the posts for the sides, which are separated by similar boards at the ends, two and one-half feet long. Boards twelve inches wide, raised above the lower ones by a space of nine to twelve inches, are nailed on the sides and ends, which completes the rack. The edges of the opening should be made perfectly smooth, to prevent chafing the wool. The largest dimensions above given are suitable for the larger breeds, and the smallest for Merinos, and still smaller are proper for their lambs. These should be set on dry ground, or under the sheds, and they can easily be removed whenever necessary. Some prefer the racks made

FIG. 5.—PORTABLE FEED RACK.

with slats, or smooth, upright sticks, in the form of the usual racks. There is no objection to this, but it should always be accompanied by a broad trough affixed to the bottom, to catch the fine hay which falls in feeding. These may be attached to the side of a building, or used double. A small lamb requires fifteen inches of space, and a large sheep two feet, for quiet,

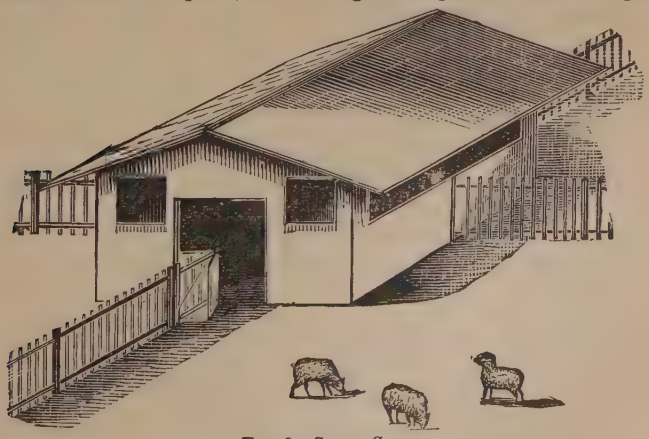


FIG. 6.—SHEEP SHED.

comfortable feeding, and at least this amount of room should be provided around the racks for every sheep.

A very convenient rack is the one shown in figure 5. This is extremely portable, and may be moved from one part of the field to another with great ease. A shed that has been found very convenient in use is shown at figure 6. It is built at the center of four fields, and has doors opening into each of them, and is so arranged that it may be entirely closed from all but the one which may be in use at the time.

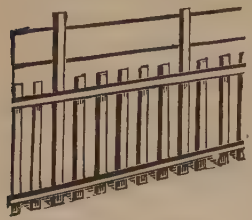


FIG. 7.—DOG GUARD.

For the protection of the sheep at night, small paddocks may be fenced in around this shed, and safety from dogs secured by the use of dog guards. These consist of wires made to run above the fence, or at right angles with the top of it, as shown at figure 7.

Food.—There is no better food for sheep than good upland hay, composed of the clover and nearly all the cultivated grasses. Bean and pea straw are valuable, and especially the former, which, if properly cured, they prefer to the best hay; and it is well adapted to the production of wool. All the other straws furnish good food, and sheep will thrive on them without hay, when fed with roots or grain. Roots ought to be given them occasionally for a change, and especially to the ewes after lambing, if this occur before putting them on to fresh pasture. They keep the stomach properly distended, the appetite and general health good, and they render their winter forage nearly equal to their summer feed. Much grain is not suited to store sheep. It is too rich, and should be given sparingly except to the lambs, the old ewes or feeble sheep, or to restore the ram after hard service. For the above purposes, oats are the best; and, if any other grain, beans and peas are given, it should be given in small quantities. When there is a deficiency of hay and roots, grain may be used with straw. But the flock ought to be so fed as to receive the same amount of nourishment throughout every part of the year. The evenness and value of the fleece depends much upon this. When the amount of nutrition is great, the wool secreting organs are distended, and the fibre becomes enlarged; when limited, they necessarily contract, and the fibre is small. This

produces a want of trueness, which the experienced wool stapler readily detects, and does not fail to estimate against the value of the fleece. Sheep ought to have a full supply of salt, and, if accessible, sulphur, ashes, tar and clay would frequently be nibbled by them when their stomach required either. Pine and hemlock boughs are a good substitute for tar, and afford a most healthful change in the winter food of sheep. Entire cleanliness and dryness are also essential to the health of the flock. The smaller sizes of sheep may be well sustained on two and a half pounds of hay, but larger sheep will consume from three and a half to four, or even five, pounds per day. Sheep, like all other animals, when exposed to cold, will consume much more than if well protected, or than during a warmer season.

Summer Management.—As soon as warm weather approaches and the grass appears, sheep become restive and impatient for the pasture. This instinct should be repressed till the ground has become thoroughly dry; and the grass has acquired substance. They ought, moreover, to be provided for the change of food, by the daily use of roots for a few days before turning out. It would also check the tendency to excessive purging, which is induced by the first spring feed, if they were housed at night, and fed for the first few days with a little sound, sweet hay. Or, if a well grown fall pasture be left the previous fall, we have found it equally good, as the sheep feed off the old grass, and the young herbage springing up through it, they gradually work from one into the other, and thus get on to their summer food without detriment. They must be provided with pure water, salt, etc., as in winter, for though they may sometimes do tolerably well without either, yet thrift and freedom from disease are cheaply secured by this slight attention. Dry, sweet pastures, and such as abound in aromatic and bitter plants, are best suited for sheep-walks. No animal, with the exception of the goat, crops so great a variety of plants. They eat many which are rejected by the horse and the ox, and which are even essential to their own wants. In this respect they are valuable assistants to the husbandman, as they feed greedily on dry mustard, burdocks, thistles, marsh-mallows, milk-weed and various other offending

plants; and the Merino exceeds the more recent breeds in the variety of his selections. Many prepare artificial pastures for their flocks. This may be done with a number of plants. Winter rye, or wheat sown early in the season, may be fed off in the fall without injury to the crop; and in the following spring the rye may be pastured till the stalks shoot up and begin to form a head. This affords an early and nutritious food. Corn may be sown broadcast or thickly in drills, and either fed off in the fields, or cut and carried to the sheep in their folds. An experiment made with white mustard for feeding sheep, shows it to be a valuable crop for this purpose. Sheep love a wide range, and, when sufficient pasturage is afforded, which always should be, it is better to give them a steady feeding than to often change from dry to green, flashy food, causing them to scour.

Cutting the Hoofs.—As the hoofs of fine wooled sheep grow rapidly, turning up in front and under at the sides, they must be clipped as often as once a year, or they become unsightly, give an awkward, hobbling gait to the animal, and the part of the horn which turns under at the sides holds dirt or dung in constant contact with the soles, and even prevents it from being readily shaken or washed out of the cleft of the foot in the natural movement of the sheep about the pastures, as would take place were the hoof in its proper place. This greatly aggravates the hoof-ail, and renders the curing of it more difficult; and it is thought by many to be the exciting cause of the disease. It is customary to clip the hoofs at tagging, or at or soon after the time of shearing.

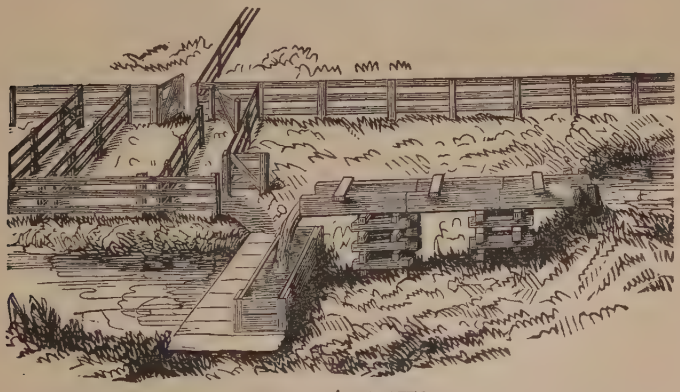
Washing.—Many judicious farmers object to washing sheep, on account of its tendency to produce colds and catarrhal affections, to which this animal is particularly subject; but it cannot well be dispensed with, as the wool is always rendered more salable; and, if the operation is carefully done, it need not be attended with injury.

In most of that portion of the United States lying north of forty degrees, the washing is performed from the middle of May till the first of June, according to the season and climate. When the streams are hard, which is frequently the case in limestone regions, it is better to attend to it immediately after

an abundant rain, which proportionately lessens the lime derived from the springs. The climate of the Southern States would admit of an earlier time. The rule should be to wait until the water has acquired sufficient warmth for bathing, and until cold rains and storms and cold nights are no longer to be expected.

The practice of a large majority of farmers is to drive their sheep to the watering-ground early in the morning, on a warm day, leaving the lambs behind. The sheep are confined on the bank of the stream by a temporary enclosure, from which they are taken, and, if not too heavy, carried into water sufficiently deep to prevent their touching bottom. They are then washed by gently squeezing the fleece with the hands, after which they are led ashore, and as much of the water pressed out as possible before letting them go, as the great weight retained in the wool frequently staggers and throws them down.

By the best flock-masters, sheep are usually washed in vats. A small stream is dammed up, and the water taken from it in an aqueduct, formed by nailing boards together, and carried till a sufficient fall is obtained to have it pour down a couple of feet or more into the vat. The body of water, to do the



WASHING APPARATUS.

work fast and well, should be some twenty-four inches wide, and five or six deep; and the swifter the current the better. The vat should be some three and a half feet deep, and large enough for four sheep to swim in it. A yard is built near the vat, from the gate of which a platform extends to and encloses

the vat on three sides. This keeps the washer from standing in the water, and makes it much easier to lift the sheep in and out. The yard is built opposite the corners of two fields—to take advantage of the angle of one of them to drive the sheep more readily into the yard, which should be large enough to contain the entire flock, if it does not exceed two hundred; and the bottom of it, as well as the smaller yard, unless well sodded over, should be covered with coarse gravel, to avoid becoming muddy. If the same establishment is used by a number of flock-masters, gravelling will always be necessary.

As soon as the flocks are confined in the middle yard, the lambs are all immediately caught out from among them, and set over the fence into the yard to the left, to prevent their being trampled down, as often happens, by the old sheep, or straying off, if let loose. As many sheep are then driven out of the middle yard into the smaller yard to the right, as it will conveniently hold. A boy stands by the gate next to the vat, to open and shut it, or the gate is drawn together with a chain and weight, and two men, catching the sheep, commence placing them in the water for the process of "wetting." As soon as the water strikes through the wool, which occupies but an instant, the sheep is lifted out and let loose. Where there are conveniences for so doing, this process may be more readily performed by driving them through a stream deep enough to compel the sheep to swim; but swimming the compact-fleeced, fine-woolled sheep for any length of time—as is practiced with the long-wools in England—will not properly cleanse the wool for steaming. The vat should, of course, be in an inclosed field, to prevent their escape. The whole flock should thus be passed over, and again driven round the field into the middle yard, where they should stand for about an hour before washing commences.

There is a large per centage of potash in the wool oil, which acts upon the dirt independent of the favorable effect which would result from thus soaking it with water alone for sometime. If washed soon after a good shower, previous wetting might be dispensed with; and it is not, perhaps, absolutely necessary in any case. If the water is warm enough to allow the sheep to remain in it for the requisite period, they

may be got clean by washing without any previous wetting; though the snowy whiteness of fleece, which has such an influence on the purchaser, is not so often nor so perfectly attained in the latter way. But little time is saved by dispensing with "wetting," as it takes proportionably longer to wash, and it is not so well for the sheep to be kept so long in the water at once.

When the washing commences, two, and sometimes four, sheep are plunged in the vat. When four are put in, two soak while two are washed. This should not, however, be done, unless the water is very warm, and the washers are uncommonly quick and expert; and it is, upon the whole, rather an objectionable practice, since few animals suffer so much from the effects of a chill as the sheep; and, if they have been previously wetted, it is wholly unnecessary. When the sheep are in the water, the two washers commence kneading the wool with their hands about the dirtier parts—the breech, belly, etc, —and they continue to turn the sheep so that the descending current of water can strike into all parts of the fleece.

As soon as the sheep are clean, which may be known by the water running entirely clear, each washer seizes his own animal by the foreparts, plunges it deep in the vats, and, taking advantage of the rebound, lifts it out, setting it gently down on its breech upon the platform. He then—if the sheep is old and weak, and it is well in all cases—presses out some of the water from the wool, and, after submitting the sheep to a process presently to be mentioned, lets it go.

There should be no mud about the vat, the earth not covered with sod, being gravelled. Sheep should be kept on clean pastures, from washing to shearing—not where they can come in contact with the ground, burnt logs, and the like—and they should not be driven over dusty roads. The washers should be strong and capable men, and, protected as they are from anything but the water running over the sides of the vat, they can labor several hours without inconvenience. Two hundred sheep will employ two experienced men not over half a day, and this rate is at times much exceeded.

It is a great object, not only as a matter of propriety and honesty, but even as an item of profit, to get the wool clean,

and of a snowy whiteness, in which condition it will always sell for more than enough extra to offset the increased labor and the diminution in weight. The average loss in American Saxon wool in scouring, after being washed on the back, is estimated at thirty-six per cent.; and in American Merino forty-two and a half per cent

Shearing.—The time which should elapse between washing and shearing depends altogether on circumstances. From four to six days of bright, warm weather is sufficient; if cold, or rainy, or cloudy, more time must intervene. Sometimes the wool remains in a condition unfit for shearing for a fortnight after washing. The rule to be observed is that the water should be thoroughly dried out, and the natural oil of the wool should so far exude as to give the wool an unctious feeling, and a lively, glittering look. If it is sheared when dry, like cotton, and before the oil has exuded, it is very difficult to thrust the shears through, the umer is checked, and the wool will not keep so well for long periods. If it is left until it gets too oily, either the manufacturer is cheated, or, what more frequently happens, the owner loses on the price.

Shearing, in this country, is always done on the threshing-floors of the barns—sometimes on low platforms, some eighteen or twenty inches high, but more commonly on the floor itself. The place where the sheep remain should be well littered down with straw, and fresh straw thrown on occasionally, to keep the sheep clean while shearing. No chaff or other substance which will stick in the wool should be used for this purpose. The shearing should not commence until the dew, if any, has dried off from the sheep. All loose straws sticking to the wool should be picked off, and whatever dung may adhere to any of the feet brushed off. The floor or tables used should be planed or worn perfectly smooth, so that they will not hold dirt, or catch the wool. They should all be thoroughly cleaned, and, if necessary, washed, preparatory to the process. If there are any sheep in the pen dirty from purging, or other causes, they should first be caught out, to prevent them from contaminating others.

The manner of shearing varies with almost every district; and it is difficult, if not impossible, to give intelligible practical

instructions, which would guide an entire novice in skillfully shearing a sheep. Practice is requisite. The following directions are as plain, perhaps, as can be made:

The shearer may place the sheep on that part of the floor assigned to him, resting on its rump, and himself in a posture with his right knee on a cushion, and the back of the animal resting against his left thigh. He grasps the shears about half way from the point to the bow, resting his thumb along the blades, which gives him better command of the points. He may then commence cutting the wool at the brisket, and, proceeding downward, all upon the sides of the belly to the extremity of the ribs, the external sides of both sides to the edges of the flanks; then back to the brisket, and thence upward, shearing the wool from the brisket, front, and both sides of the neck, but not yet the back of it, and also the poll, or forepart, and top of the head. Then "the jacket is opened" of the sheep, and its position, as well as that of the shearer, is changed by the animal's being turned flat upon its side, one knee of the shearer resting on the cushion, and the other gently pressing the fore-quarter of the animal, to prevent any struggling. He then resumes cutting upon the flank and rump, and thence onward to the head. Thus one side is complete. The sheep is then turned on the other side—in doing which great care is requisite to prevent the fleeces being torn—and the shearer proceeds as upon the other, which finishes. He must then take the sheep near to the door through which it is to pass out, and neatly trim the legs, leaving not a solitary lock anywhere as a lodging place for ticks. It is absolutely necessary for him to remove from his stand to trim, otherwise the useless stuff from the legs becomes intermingled with the fleece wool. In the use of the shears, the blades should be laid as flat to the skin as possible, the points not lowered too much, nor should more than from one to two inches be cut at a clip, and frequently not so much, depending on the part, and the compactness of the wool.

Good shearers will shear, on the average, twenty-five Merinos per day; but a new beginner should not attempt to exceed from one-third to one-half of that number. It is the last process in the world which should be hurried, as the

shearer will, in that case, soon leave more than enough wool on his sheep to pay for his day's wages. Wool ought not to be sheared, and must not be done up, with any water in it. If wounds are made, as sometimes happen with unskillful operators, a mixture of tar and grease ought to be applied.

Cold Storms.—These occurring soon after shearing sometimes destroy sheep, in the northern portion of the country, especially the delicate Saxons; forty or fifty of which have, at times, perished out of a single flock, from one night's exposure. Sheep, in such cases, should be housed; or, where this is impracticable, driven into dense forests.

Sun-Scald.—When they are sheared close in very hot weather, have no shade in their pastures, and especially where they are driven immediately considerable distances, or rapidly, over burning and dusty roads, their backs are sometimes so scorched by the sun that their wool comes off. If let alone, the matter is not a serious one; but the application of refuse lard to the back will hasten the cure, and the starting of the wool.

Ticks.—These vermin, when very numerous, greatly annoy and enfeeble the sheep in winter, and should be kept entirely out of the flock. The draft upon the vitality of lambs infested with ticks is very great, and sufficient to arrest their growth altogether. To rid the flock of these pests is therefore a necessary labor in the spring or early summer, and, if need be, again in the autumn. The easiest remedy is to dip both sheep and lambs, as soon as the sheep are shorn, and again in August or September, in a decoction of tobacco mixed with sulphur. Coarse plug tobacco, or tobacco stems, which are cheaper than the leaves, and equally effective, are steeped in water at a boiling heat, but not boiling, at the rate of four pounds to twenty gallons of water. One pound of flowers of sulphur is then stirred in the liquid, which is brought to a temperature of 120 degrees, and kept so

Fig. 8.—Sheep-Tick and Pupa.

during the dipping by the addition of fresh hot liquor. During the dipping, the mixture is kept stirred to prevent the sulphur

Fig. 9.—Dipping Sheep.

from subsiding. The dip may be conveniently placed in a trough or a tub large enough to allow of the immersion of the sheep or the lamb, which is taken by the feet by two men and plunged into the bath at the temperature mentioned, where it is held for a minute or two until the wool is thoroughly saturated. The animal is then placed in a pen with a raised floor sloping on each side to a trough in the middle, along which the superabundant liquor escapes into a pail or a tub placed to receive it. The method of dipping (shown at figures 9 and 10), is calculated for small flocks, or for a few hundred lambs. For larger flocks, a larger tank is provided, 12 feet long, three feet wide, and four feet deep. A fenced platform leads from a pen in which the sheep are gathered, up to the edge of the dipping tank, and the sheep are taken one by one from the pen, led up the platform, and pushed into the tank in which the dip is sufficiently deep to cover them. As the sheep plunge into the dip, they are seized and kept beneath it, except the head, which alone is suffered to emerge above it. If, in their struggles, a little of the dip enters their nostrils, no harm results, but the hot tobacco water is, on the contrary, often beneficial to those sheep which are affected by

catarrh or grub in the head, and the violent sneezings which follow may help to free them from these troublesome parasites which often inhabit the nasal sinuses. The sheep are rapidly passed from hand to hand along the tank until they reach the end, where there is a sloping plank upon which they can walk up to another platform. Here they are allowed to remain while the excess of dip is squeezed from their wool. From this the liquid drains into tubs, and is carried to the boiler to be reheated, and then returned to the tank for use again. The cost of dipping a large flock, numbering several thousands, in this manner twice in the season, is five cents a head, and the improvement in the quality of the wool, which results from the cleansing of the skin from dust, grease, and the accumulated refuse of its secretions, and its increase in quantity, consequent upon the greater comfort of the sheep, and their escape from the persecution of ticks and other parasites, is estimated at 20 cents per head, so that the cost is repaid more than three-fold. The comforting knowledge to the humane shepherd that his flock is freed from a most annoying torment, is also something, which, although it does not enter into a pecuniary calculation, and is not measured by dollars and cents, yet is not on that account unworthy of consideration.

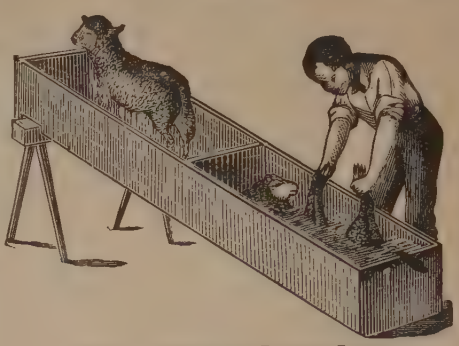


FIG. 10.—TROUGH FOR DIPPING LAMBS.

Marking or Branding.—The sheep should be marked soon after shearing, or mistakes may occur. Every sheep-owner should be provided with a marking instrument, which will stamp his initials, or some other distinctive mark, such as a small circle, an oval, a triangle, or a square, at a single stroke, and with uniformity, on the sheep. It is customary to have the mark cut out of a plate of thin iron, with an iron handle terminating in wood; but one made by cutting a type, or raised

letter, or character, on the end of a stick of light wood, such as pine or basswood, is found to be better.

Various pigments are used for marking. Many boil tar until it assumes a glazed, hard consistency when cold, and give it a brilliant, black color by stirring in a little lamp-black during the boiling. This is applied when just cold enough not to burn the sheep's hide, and it forms a bright conspicuous mark all the year round. The manufacturer, however, prefers the substitution of oil and turpentine for tar, as the latter is cleansed out of the wool with some difficulty. It should be boiled in an iron vessel, with high sides, to prevent it from taking fire, on a small furnace or chafing-dish near which it is to be used. When cool enough, forty or fifty sheep can be marked before it gets too stiff. It is then warmed from time to time, as necessary, on the chafing-dish.

Maggots.—Rams with horns growing closely to their heads are very liable to have maggots generated under them, particularly if the skin on the surrounding parts becomes broken by fighting; and these, unless removed, soon destroy the animal. Boiled tar, or the marking substance first described, is both remedy and preventive. If it is put under the horns at the time of marking, no trouble will ever arise from this cause.

Sometimes when a sheep scours in warm weather, and clotted dung adheres about the anus, maggots are generated under it, and the sheep perishes miserably. As a preventive, the dung should be removed; as a remedy, the dung and maggots should be removed—the latter by touching them with a little turpentine, and sulphur and grease afterward applied to the excoriated surface.

Shortening the Horns.—A convolution of the horn of a ram sometimes so presses in upon the side of the head or neck that it is necessary to shave or rasp it away on the under side, to prevent ultimately fatal results. The points of the horns of both ram and ewe frequently turn in so that they will grow into the flesh, and sometimes into the eye, unless shortened. The toe-nippers will often suffice on the thin extremity of a horn; if not, a fine saw must be used. The marking-time affords the best opportunity for attending to this operation.

DISEASES AND REMEDIES.

Administering Medicine.—The stomach into which medicines are to be administered is the fourth or digesting stomach. The comparatively insensible walls of the rumen, or paunch, are but slightly acted upon, except by doses of very improper magnitude Medicine, to reach the fourth stomach, should be given in a state as nearly approaching fluidity as may be. Even then it may be given in such a manner as to defeat the object in view.

If the animal forcibly gulps fluids down, or if they are given hastily and bodily, they will follow the caul at the base of the gullet with considerable momentum, force asunder the pillars, and enter the rumen; if they are drunk more slowly, or administered gently, they will trickle down the throat, glide over these pillars, and pass on through the maniplus to the true stomach.

Bleeding.—Bleeding from the ears or tail, as is commonly practiced, rarely extracts a quantity of blood sufficient to do any good where bleeding is indicated. To bleed from the eye-vein, the point of the knife is usually inserted near the lower extremity of the pouch below the eye, pressed down, and then a cut made inward toward the middle of the face.

Bleeding from the angular or cheek vein is recommended in the lower part of the cheek, at the spot where the root of the fourth tooth is placed, which is the thickest part of the cheek, and is marked on the external surface of the bone of the upper jaw, by a tubercle, sufficiently prominent to be very sensible to the finger when the skin of the cheek is touched. This tubercle is a certain index to the angular vein, which is placed below. The shepherd takes the sheep between his legs; his left hand more advanced than his right, which he places under the head, and grasps the under jaw near to the hinder extremity, in order to press the angular vein, which passes in that place, for the purpose of making it swell; he touches the right cheek at the spot nearly equidistant from the eye and mouth, and there finds the tubercle which is to guide him, and also feels the angular vein swelled below this tubercle; he then makes the incision from below upward, half a finger's breadth below the middle of the tubercle. When the vein is no longer pressed upon the bleeding will commonly cease; if not, a pin may be passed through the lips of the orifice and a lock of wool tied around them.

For thorough bleeding, the jugular vein is greatly to be preferred. The sheep should be firmly held by the head by an assistant, and the body confined between his knees, with its rump against a wall. Some of the wool is then cut away from

the middle of the neck over the jugular vein, and a ligature, brought in contact with the neck by opening the wool, is tied around it below the shorn spot near the shoulder. The vein will soon rise. The orifice may be secured, after bleeding, as before described.

The good effects of bleeding depend almost as much on the rapidity with which the blood is abstracted as to the amount taken. This is especially true in acute diseases. Either bleed rapidly or do not bleed at all. The orifice in the vein, therefore, should be of some length, and made lengthwise with the vein. A lancet is by far the best implement; and even a sharp-pointed penknife is preferable to the bungling gleam. Bleeding, moreover, should always be resorted to, when it is indicated at all, as nearly as possible to the commencement of the malady.

The amount of blood drawn should never be betermined by admeasurement, but by constitutional effect—the lowering of the pulse, and indications of weakness. In urgent cases—apoplexy, or cerebral inflammation, for example—it would be proper to bleed until the sheep staggers or falls. The quantity of blood in the sheep is less, in comparison, than that in the horse or ox. The blood of the horse constitutes about one eighteenth part of his weight; and that of the ox at least one-twentieth; while that of the sheep, in ordinary condition, is one-twenty-second. For this reason, more caution should be exercised in bleeding the latter, especially in frequently resorting to it; otherwise, the vital powers will be rapidly and fatally prostrated. Many a sheep has been destroyed by bleeding freely in disorders not requiring it, and in disorders which did require it at the commencement, but of which the inflammatory stage had passed.

Rot, or Hydatids in the Liver.—This parasite, which affects the liver of sheep, is known as the fluke, and is usually found in the biliary ducts. Rot, in its advanced stage, is a disease of a very formidable character, and its associations, closely resemble dropsy. A serous fluid accumulates beneath the skin, hence some people call it the water rot.

Causes.—Wet pastures, and exposure to storms and changes of weather, with innutritious diet, are the exciting causes of this malady.

Treatment.—If flukes are present, it is evident that in order to strike at the root of the malady we must get rid of them, which can only be effected by bringing about a healthy condition of the system. Nothing that can be done by the application of medicine will act on them to affect their vitality. It is only by strengthening the animal powers that we are en-

abled to give sufficient tone to the system to throw off the flukes. For that purpose many advocate salt. Salt is an excellent stimulative to the digestive organs, and may also be of service in restoring the biliary secretion, from the soda which it contains. So well is its stimulative action known, that some individuals always keep salt in the troughs containing animals' food. That this is a preventive they have good proof, seeing that it matters not how much the soil might be in salt marshes, no sheep are ever attacked by rot in them, while those sent there infected very often come back free. Salt, therefore, must not be neglected. But then comes the question, can they not do something more? They can. They must throw tonics into the system, especially those that are obtained in the mineral kingdom. The sulphate of iron (iron is found in animal matter) is one of the constituents of the blood, and, used in the form of sulphate, it gives a greater tone and energy to the frame than in any other form. Its use, therefore, ought never to be neglected in the earlier stages of the disease.

Yellows.—This term is used by shepherds to designate disease of the liver.

Symptoms.—The affected animal has a peculiar languid appearance, frequently shaking the head, as if parasites were in the nostrils; the head is pressed against any elevated ground, sometimes against the fence or a post; the animal moves lazily along, with its nose almost touching the ground; the membranes of the eyes and nose have a yellow tinge; the same is true of the skin; a marked yellowness is observed on the inside of the thigs and anus. As the disease advances, these morbid appearances are augmented. The patient grates its teeth; stands with the head pendulous, almost touching the ground; then soon falls, and dies without a struggle.

The autopsy reveals the following: The liver has a mottled appearance, and its structure is easily broken down; the gall-bladder is usually full of dark-colored, tarry-looking bile; kidneys, stomach, and intestines, tolerably healthy. Should any urine be found in the bladder, it will be of a dark color. The heart is pale and flabby; the lungs, healthy, yet the chest usually contains a quart or more of dark-colored serum. On removing the skin, the surface of the body is yellow (jaundiced).

Treatment.—Remove the diseased animals from the flock and put them in a dry shed. Then prepare the following:

1 pound of fluid extract of leptandra (Culver's root).
6 ounces of powdered hyposulphite of soda.
1 quart of water.

Dissolve the soda in the water, then add the leptandrin. Dose, one ounce (fluid) twice daily. Let the affected animals have salt; grass should also be cut and placed before them.

Vertigo, or Giddiness.—Vertigo, or giddiness, is a disease of the nervous system, occasioned most frequently by a parasite located in the brain. The parasite is named cænarus cerebralis, and belongs to the species know as the hydatids. Lambs from the age of two months, or from four to twelve months, are, when predisposed, apt to become the subject of it. The disease is very apt to end in organic disease of the brain and spinal marrow.

The disease is of hereditary origin, and comes from faults or defects in one or both parents, and also from the too early practice of breeding, which often obtains in some sections of country. In order to guard against the disease, we must put out of the breeding fold both males and females that have shown any signs of the disorder, and not breed from the ewes under the age of thirty months, nor from rams until they have attained their second year.

TREATMENT.—In the treatment of the disease, our object is to give tone to the system, and saturate the blood with some agent (sulphur) which is known to be obnoxious to parasites in general. Take

1 pound of sulphur.
6 ounces of powdered sulphate of iron.
1 pound of powdered poplar bark.

Let this be thoroughly mixed, place it in a stoppered bottle, and keep it in a dark place. Mix a tablespoonful daily in bran, and place it in the feed trough, or mix it in a tablespoonful of syrup, and administer it by means of an iron spoon.

Some persons contend that turnips, when fed to sheep, are apt to produce hydatids.

Foot Rot.—CAUSES.—General debility, exposure in wet pastures, contagion, foul habit of body.

SYMPTOMS.—The animal is observed to limp on one or both of the fore or hind legs. Sometimes the whole four are affected. The parts are hot, tender, and swollen, and exude a fetid fluid. The animal is now incapable of walking, and, if not speedily relieved, death ensues. The form of rot is contagious, so that, if the diseased are not separated from the healthy, the latter soon become infected. To propagate malignant rot, it is quite sufficient that a flock should pass over a place which has a little before been walked over by a diseased sheep.

TREATMENT.—Endeavor to ascertain the exciting cause, and, if possible, remove it. If the disease has assumed a putrid type, the superfluous horn may be removed. The parts are then to be washed with

4 ounces of pyroligneous acid.
3 ounces of water. Mix.

A piece of lint is afterward to be saturated with the above, and applied as a dressing, and changed as occasion may require.

The local remedy will avail but little unless we sustain the living powers, and thus improve the secretions. Our usual remedies are:

1 ounce of powdered golden seal.
½ ounce of powdered sulphur.
1 ounce of powdered charcoal.
1 ounce of powdered sassafras.
2 drachms of powdered assafœtida.
2 pounds of flaxseed.

Mix, and give a tablespoonful twice a day in the food.

Supposing a number of animals to be affected, it would occupy too much time to treat them singly; hence, let them be made to walk slowly, or linger for some time in a wooden trough, the floor of which may be covered, to the depth of one inch, with the following:

2 pints of linseed oil.
4 pints of pyroligneous acid.
1 pint of kerosene.

In the above proportions, the required quantity may be prepared.

Grubs in the Nostrils.—Grubs in the nostrils are occasioned by the gadfly, which deposits her ova in the nostrils of sheep. After a short time the ova bring forth parasites in the larvæal state; the latter migrate within the interior of the nostrils, causing the sheep much pain and annoyance. When the larvæ are capable of exercising an independent existence, they undergo the same evolution which obtains in the case of the bot parasite; namely, they burrow into the earth, and finally become metamorphosed into the gadfly.

It seems that the gadfly selects its subjects, and the weakest and the most unpromising of the flock are usually its victims; hence close attention to the requirements and condition of a flock may, to a certain extent, act as a preventive. Some farmers, in view of preventing the gadfly, smear the nose of their sheep with common tar. Others plow up a piece of land where sheep are pastured, into which they thrust their noses, and then, for the time being, they baffle the gadfly. It is hardly good policy to attempt, either by mechanical or medicinal means, to dislodge the parasites; for the remedy might be worse than the disease. When the ova have arrived at maturity, the sheep themselves aid in the dislodgement with acts of snorting, sneezing, and coughing.

Inflammation of the Eye.—Inflammation of the eye is very rapidly detected by an acute redness which pervades the lining membranes of the eyelids and that which affords a partial

covering to the eyeball. The afflicted animal keeps the eyelids partly closed; an effusion of tears runs over the lower angle of the eye; there is intolerance to light, and the animal appears to suffer considerable pain.

TREATMENT.—Separate the patient from the flock, and bathe the eye occasionally with the following lotion:

1 ounce of sugar of milk.
1 drachm of fluid extract of hops.
6 ounces of rain water. Mix.

Should the disease run on to cataract, the sight cannot be restored.

Inflammation of the Lungs.—Inflammation of the lungs is usually the result of exposure; or, it may arise in consequence of herding too many sheep together; sometimes it makes its appearance without any perceptible cause. An impure atmosphere, however, may be set down as the ordinary exciting cause of this malady.

TREATMENT.—Place upon the tongue ten drops of fluid extract of gelseminum, morning and evening. Dissolve one ounce of chlorate of potass in half a pint of flaxseed tea, and give it daily as a drench until the animal improves. Let the patient be placed in a secluded spot, under cover, and, if the case is curable, health will soon return.

The most marked symptoms of pneumonia are panting and heaving at th ` .ks, quickened respiration, discharge from the nose, and coug.. There is also a cessation of rumination. In short, the same symptoms prevail in this disease as in pneumonia of cattle.

Common Catarrh.—This affection prevails most extensively among sheep that have been exposed to rains and unpleasant weather. The disease manifests itself in the form of a defluxion from the nostrils of a muco-serous discharge, accompanied by frequent sneezing, and occasional cough. As soon as the disease is discovered, the affected animals should be placed in comfortable quarters. Then prepare the following drench:

2 ounces of composition powder.
1 quart of boiling water.

Pour the boiling water on the powder; let the mixture stand in a warm place for an hour; pour off the clear liquor, and add two ounces of sugar of milk. Dose: A wine-glassful once or twice daily.

Malignant epizootic catarrh may be treated in the same manner, with the addition of one ounce of chlorate of potass per day, which can be dissolved in the above drench.

Diarrhœa and Dysentery.—Curable cases of the above

character are brought to a favorable termination by using the following drench:

1 ounce of finely pulverized animal charcoal.
1 gill of scalded cow's milk.
1 drachm of hyposulphite of soda. Mix.

The above constitutes a dose. It may be repeated as often as the emergency seems to require; but, should the subject be a young lamb, one-half the above quantity will suffice.

Constipation of the Bowels.—Constipation is almost always the result of a deranged condition of the digestive organs. A deranged condition of the liver, for example, will result in costiveness, for which the following drench is recommended:

2 ounces of Glauber salts.
1 teaspoonful of fluid extract of leptandra.
½ pint of thin gruel.

Dissolve the salts in the gruel, and drench the animal with the same.

Tympanites.—This disease is very easily recognized by the bloated appearance of the animal. It is occasioned by the food running into fermentation and generating gas. The following remedy is a sure cure for tympanites, administered as a drench:

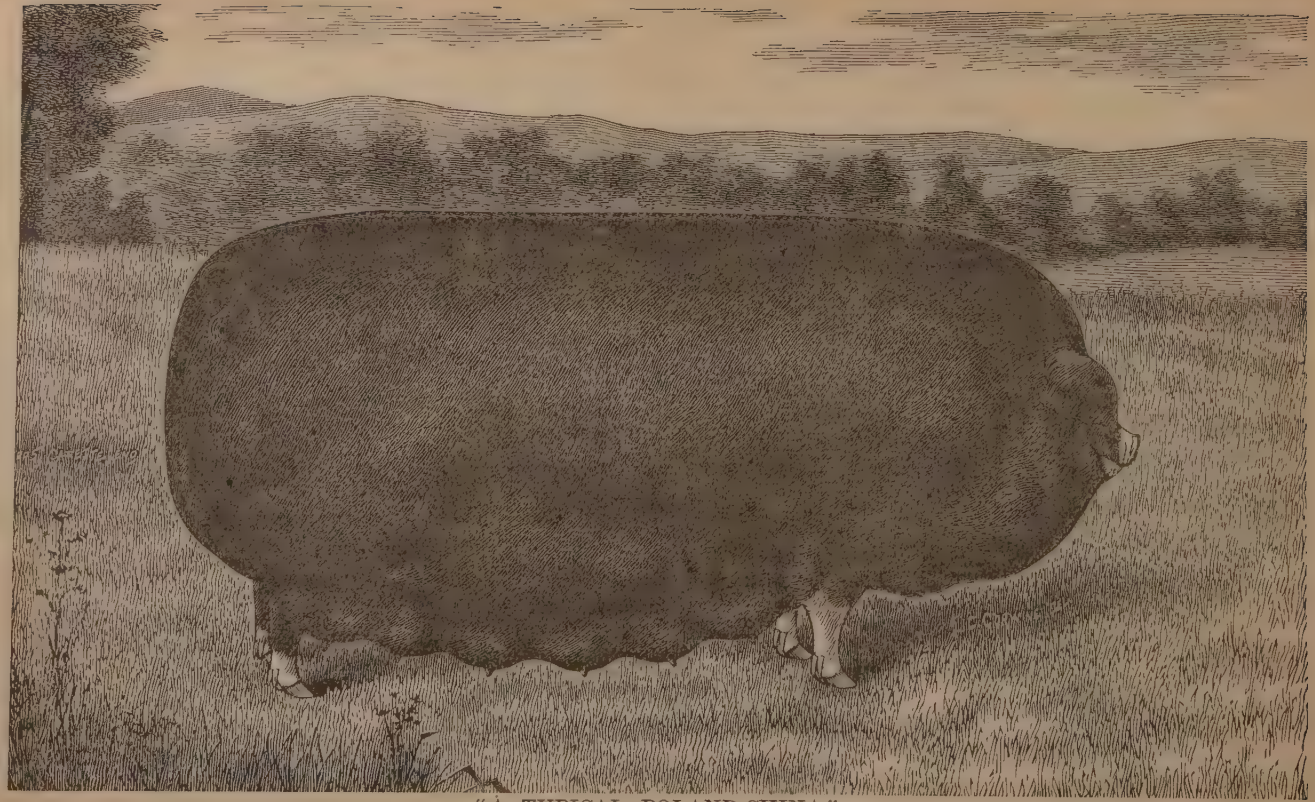
4 drachms of hyposulphite of soda.
1 drachm of fluid extract of golden seal.
2 drachms of fluid extract of ginger.
1 wine-glassful of water.

Colic.—Sheep are occasionally seen, particularly in the winter, lying down and rising every moment or two, and constantly stretching their fore and hind legs so far apart that their bellies almost touch the ground. They appear to be in much pain, refuse all food, and not unfrequently die unless relieved. This disease, popularly known as the "stretches," is erroneously attributed to an involution of one part of the intestine with another; it being, in reality, a species of flatulent colic induced by costiveness.

TREATMENT.—Half an ounce of epsom salts, a drachm of Jamaica ginger, and sixty drops of essence of peppermint. The salts alone, however, will effect a cure; as will, also, an equivalent dose of linseed oil, or even hog's lard.

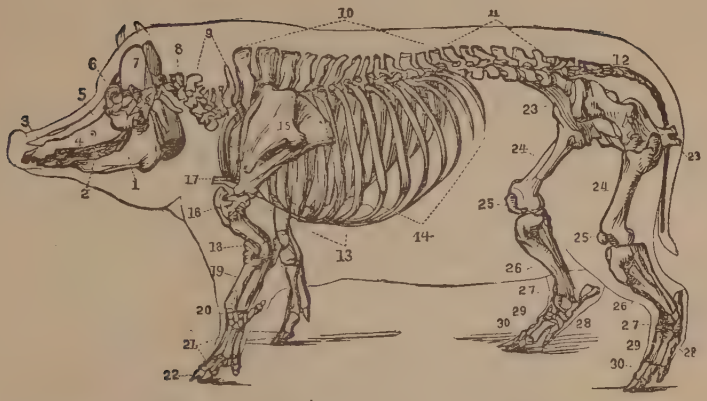
Fractures.—If there be no wound of the soft parts, the bone simply being broken, the treatment is extremely easy. Apply a piece of wet leather, taking care to ease the limb when swelling supervenes. When the swelling is considerable, and fever present, the best course is to open a vein of the head or neck, allowing a quantity of blood to escape, proportioned to the size and condition of the animal, and the urgency of the symptoms. Purgatives in such cases should never be neglected.

Epsom salts, in ounce doses, given either as a gruel or a drench, will be found to answer the purpose well. If the broken bones are kept steady, the cure will be complete in from three to four weeks, the process of reunion always proceeding faster in a young than in an old sheep. Should the soft parts be injured to any extent, or the ends of the bone protrude, recovery is very uncertain; and it will become a question whether it would not be better to convert the animal at once into mutton.



"A TYPICAL POLAND-CHINA."

SWINE.



SKELETON OF THE HOG AS COVERED BY THE MUSCLES.

1.—The lower jaw. 2.—The teeth. 3.—The nasal bones. 4.—The upper jaw. 5.—The frontal bone. 6.—The orbit or socket of the eye. 7.—The occipital bone. 8.—The first vertebræ of the neck. 9.—The vertebræ of the neck. 10.—The vertebræ of the back. 11.—The vertebræ of the loins. 12.—The bones of the tail. 13,—14.—The true and false ribs. 15.—The shoulder-blade. 16.—The round shoulder-bone. 17—The breast-bone. 18.—The elbow. 19.—The bone of the fore-arm. 20.—The navicular bone. 21.—The first and second bone of the foot. 22.—The bones of the hoof. 23.—The haunch bones. 24.—The thigh bone. 25.—The stifle bone. 26.—The upper bone of the leg. 27.—The hock bones. 28.—The navicular bone. 29.—The first digits of the foot. 30.—The second digits of the foot.

American Swine.—In the United States, swine have been an object of attention since its earliest settlement, and, whenever a profitable market has been found for pork abroad, it has been exported to the full extent of the demand. Swine are not, however, indigenous to this country, but were doubtless originally brought hither by the early English settlers; and the breed thus introduced may still be distinguished by the traces they retain of their parent stock. France, also,

as well as Spain, and, during the existence of the slave trade, Africa, have also combined to furnish varieties of this animal, so much esteemed throughout the whole of the country, as furnishing a valuable article of food. For nearly twenty years, following the commencement of the general European wars, soon after the organization of our national government, pork was a comparatively large article of commerce; but exports for a time diminished, and it was not until within a more recent period that this staple has been brought up to its former standard as an article of exportation to that country. The recent use which has been made of its carcass in converting it into lard oil, has tended to still further increase its consumption.

They are read in every part of the Union, and, when properly managed, always at a profit. At the extreme North, in the neighborhood of large markets, and on such of the Southern plantations as are particularly suited to sugar or rice, they should not be raised beyond the number required for the consumption of the coarse or refuse food produced. Swine are advantageously kept in connection with a dairy or orchard; since, with little additional food, besides what is thus afforded, they can be put in good condition for the butcher.

On the rich bottoms and other lands of the West, however, where Indian corn is raised in profusion and at small expense, they can be reared in the greatest numbers and yield the largest profit. The Scioto, Miami, Wabash, Illinois, and other valleys, and extensive tracts in Kentucky, Tennessee, Missouri, and some adjoining States, have for many years taken the lead in the production of swine; and it is probable that the climate and soil, which are peculiarly suited to their rapid growth, as well as that of their appropriate food, will enable them to hold their position as the leading pork producers of the North American Continent.

The breeds cultivated in this country are numerous; and, like our native cattle, they embrace many of the best, and a few of the worst, to be found among the species. Great attention has been paid, for many years, to their improvement in the Eastern States; and nowhere are there better specimens than in many of their yards. This spirit has rapidly extended West

and South; and among most of the intelligent farmers, who make them a leading object of attention on their rich corn-grounds, swine have attained a high degree of excellence. This does not consist in the introduction and perpetuity of any distinct races, so much as in the breeding up to a desirable size and aptitude for fattening, from such meritorious individuals of any breed, or their crosses, as come within their reach.

The Byefield.—This breed was formerly in good repute in the Eastern States, and did much good among the species generally. They are white, with fine curly hair, well made and compact, moderate in size and length, with broad backs, and at fifteen months attaining some three hundred to three hundred and fifty pounds net.

The Bedford.—The Bedford or Woburn is a breed originating with the Duke of Bedford, on his estate at Woburn, and brought to their perfection probably by judicious crosses of the Chinese hog on some of the best English swine. A pair was sent by the Duke to this country, as a present to General Washington; but they were dishonestly sold by the messenger, in Maryland, in which State, and in Pennsylvania, they were productive of much good at an early day, by their extensive distribution through different States. Several other importations of this breed have been made at various times, and especially by the enterprising masters of the Liverpool packets, in the neighborhood of New York. They are a large, spotted animal, well made, and inclining to early maturity and fattening. This is an exceedingly valuable hog, but nearly extinct, both in England and in this country, as a breed

The Leicester.—The old Leicestershire breed, in England, was a perfect type of the original hogs of the midland counties; large, ungainly, slab-sided animals, of a light color, and spotted with brown or black. The only good parts about them were their heads and ears, which showed greater traces of breeding than any other portions. These have been materially improved by various crosses, and the original breed has nearly lost all its peculiarities and defects. They may now be characterized as a large, white hog, generally coarse in the bone and hair, great eaters, and slow in maturing. Some varieties differ

essentially in these particulars, and mature early on a moderate amount of food. The crosses with small compact breeds are generally thrifty, desirable animal

The Yorkshire.—The old Yorkshire breed was one of the very large varieties, and one of the most unprofitable for a farmer, being greedy feeders, difficult to fatten, and unsound in constitution. They were of a dirty white or yellow color, spotted with black, had long legs, flat sides, narrow backs, weak loins and large bones. Their hair was short and wiry, and intermingled with numerous bristles about the head and neck, and their ears long. When full grown and fat, they seldom weighed more than from three hundred and fifty to four hundred pounds.

These have been crossed with pigs of the improved Leicester breed; and where the crossings have been judiciously managed, and not carried too far, a fine race of deep-sided, short-legged, thin-haired animals has been obtained, fattening kindly, and rising to a weight of from two hundred and fifty to four hundred pounds, when killed between one and two years old; and, when kept over two years, reaching even from five hundred to seven hundred pounds.

They have also been crossed with the Chinese, Neapolitan, and Berkshire breeds, and hardy, profitable, well-proportioned animals thereby obtained. The original breed, in its purity, size, and defectiveness, is now hardly to be met with, having shared the fate of the other large old breeds, and given place to smaller and more symmetrical animals. The Yorkshire white is among the large breeds deserving commendation among us. To the same class belong also the large Miami white, and the Kenilworth; each frequently attaining, when dressed, a weight of from six hundred to eight hundred pounds.

The Chinese.—This hog is to be found in the south-eastern countries of Asia, as Siam, Cochin China, the Burman Empire, Cambodia, Malacca, Sumatra, and in Batavia and other Eastern islands; and is, without doubt, the parent stock of the best European and American swine.

There are two distinct varieties, the white and the black;

both fatten readily, but from their diminutive size attain no great weight. They are small in limb, round in body, short in the head, wide in the cheek, and high in the chine; covered with very fine bristles growing from an exceedingly thin skin; and not peculiarily symmetrical, since, when fat, the head is so buried in the neck that little more than the tip of the snout is visible. The pure Chinese is too delicate and susceptible to cold ever to become a really profitable animal in this country; it is difficult to rear, and the sows are not good nurses; but one or two judicious crosses have, in a manner, naturalized it. This breed will fatten readily, and on a comparatively small quantity of food; the flesh is exceedingly delicate, but does not make good bacon, and is often too fat and oily to be generally esteemed as pork. They are chiefly kept by those who rear sucking-pigs for the market, as they make excellent roasters at three weeks or a month old. Five, and even seven, varieties of this breed are distinguished, but these are doubtless the results of different crosses with our native kinds; among these are black, white, black and white, spotted, blue and white, and sandy.

Many valuable crosses have been made with these animals; for the prevalent fault of the old English breeds have been coarseness of flesh, unwieldiness of form, and want of aptitude to fatten, an admixture of the Chinese breed has materially corrected these defects. Most of our smaller breeds are more or less indebted to the Asiatic swine for their present compactness of form, the readiness with which they fatten on a small quantity of food, and their early maturity; but these advantages are not considered, in the judgment of some, as sufficiently great to compensate for the diminution in size, the increased delicacy of the animals, and the decrease of number in the litters. The best cross is between the Berkshire and Chinese.

The Suffolk.—The old Suffolks are white in color, long-legged, long-bodied, with narrow backs, broad foreheads, short hams, and abundance of bristles. They are by no means profitable animals. A cross between the Suffolk and Lincoln has produced a hardy animal, which fattens kindly, and attains the weight of from four to five hundred and fifty, and even

seven hundred, pounds. Another cross much approved by farmers is that of the Suffolk and Berkshire.

There are few better breeds, perhaps, than the improved Suffolk—that is, the Suffolk crossed with the Chinese. The greater part of the pigs on the late Prince Albert's farm, near Windsor, were of this breed. They are well-formed, compact, of medium size, with round, bulky bodies, short legs, small heads, and fat cheeks. Many, at a year or fifteen months old, weigh from two hundred and fifty to three hundred pounds; at which age they make fine bacon hogs. The sucking-pigs are also very delicate and delicious.

Those arising from Berkshire and Suffolk are not so well shaped as the latter, being coarser, long-legged, and more prominent about the hips. They are mostly white, with thin, fine hair; some few are spotted, and are easily kept in fine condition; they have a decided aptitude to fatten early, and are likewise valuable as store-pigs.

The Berkshire.—The Berkshire pigs belong to the large class, and are distinguished by their color, which is a sandy or whitish brown, spotted regularly with dark brown or black spots, and by their having no bristles. The hair is long, thin, somewhat curly, and looks rough; the ears are fringed with long hair round the outer edge, which gives them a ragged or feathery appearance; the body is thick, compact, and well formed; the legs short, the sides broad, the head well set on, the snout short, the jowl thick, the ears erect, the skin exceedingly thin in texture, the flesh firm and well flavored, and the bacon very superior. This breed has generally been considered one of the best in England, on account of its smallness of bone, early maturity, aptitude to fatten on little food, hardihood, and the females being good breeders. Hogs of the pure original breed have been known to weigh from eight hundred to nine hundred and fifty pounds.

Numerous crosses have been made from this breed; the principal foreign ones are those with the Chinese and Neapoiltan swine, made with the view of decreasing the size of the animal, improving the flavor of the flesh, and rendering it more delicate; and the animals thus attained are superior to almost any other in their aptitude to fatten; but are very susceptible

to cold, from being almost entirely without hair. A cross with the Suffolk and Norfolk also is much improved, which produces a hardy kind, yielding well when sent to the butcher; although, under most circumstances, the pure Berkshire is the best.

No other breeds have been so extensively diffused in the United States, within comparatively so brief a period, as the Berkshires, and they have produced a marked improvement in many of our former races. They weigh variously, from two hundred and fifty to four hundred pounds net, at sixteen months, according to their food and style of breeding; and some full-grown have dressed to more than eight hundred pounds. They particularly excel in their hams, which are round, full, and heavy, and contain a large proportion of lean, tender, and juicy meat, of the best flavor.

None of our improved breeds afford long, coarse hair, or bristles; and it is a gratifying evidence of our decided improvement in this department of domestic animals, that our brush-makers are obliged to import most of what they use from Russia and northern Europe. This improvement is manifest not only in the hair, but in the skin, which is soft and mellow to the touch; in the finer bones, shorter head, upright ears, dishing face, delicate muzzle, and wild eye; and in the short legs, low flanks, deep and wide chest, broad back, and early maturity.

Formation of the Teeth.—The hog has fourteen molar teeth in each jaw, six incisors, and two canines; these latter are curved upward, and commonly denominated tushes. The molar teeth are all slightly different in structure, and increase in size from first to last; they bear no slight resemblance to those of the human being. The incisors are so fantastic in form that they cannot well be described, and their destined functions are by no means clear. Those in the lower jaw are long, round, and nearly straight; of those in the upper jaw, four closely resemble the corresponding teeth in the horse; while the two corner incisors bear something of the shape of those of the dog. These latter are placed so near the tushes as often to obstruct their growth, and it is sometimes necessary to draw them, in order to relieve the animal and enable him to feed

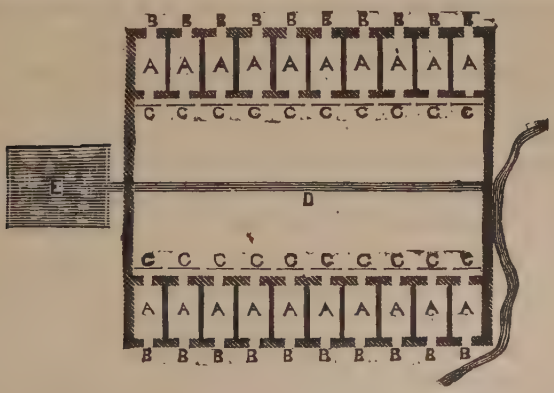
The hog is born with two molars on each side of the jaw; by the time he is three or four months old, he is provided with his incisive milk-teeth and the tushes; the supernumerary molars protrude between the fifth and seventh months, as does the first back molar; the second back molar is cut at about the age of ten months; and the third, generally, not until the animal is three years old. The upper corner teeth are shed at about the age of six or eight months; and the lower ones at about seven, nine, or ten months old, and replaced by the permanent ones. The milk tushes are also shed and replaced between six and ten months old. The age of twenty months, and from that to two years, is denoted by the shedding and replacement of the middle incisors, or pincers, in both jaws, and the formation of a black circle at the base of the tushes. At about two years and a half or three years of age, the adult middle teeth in both jaws protrude, and the pincers are becoming black and rounded at the ends.

After three years, the age may be computed by the growth of the tushes; at about four years, or rather before, the upper tushes begin to raise the lip; at five they protrude through the lips; and, at six years, the tushes of the lower jaw begin to show themselves out of the mouth, and assume a spiral form. These acquire a prodigious length in old animals, and particularly in uncastrated boars; and, as they increase in size, they become curved backward and outward, and at length are so crooked as to interfere with the motion of the jaws to such a degree that it is necessary to cut off those projecting teeth, which is done with the file, or with nippers.

Houses and Piggeries.—An inclosure, proportionate to the number of swine which you intend to keep, and, if possible, so managed as to admit of extending the accommodation, if necessary, will be found the best for general purposes. It should be provided with a range of sheds, so situated as to be thoroughly sheltered from north and east winds, and snow, rain, and inclement weather; paved or flagged at the bottom, and sloping outwards. We cannot too frequently reiterate our observations relative to the paramount necessity of cleanliness and dryness; let, therefore, both enclosure and sheds possess the means of being kept so. To insure both these desiderata,

as far as possible, very efficient drainage is absolutely necessary; and it will be a great advantage if the bottom is of concrete as well as drained. The whole pig-cote should slope towards one corner, and be intersected by channels in the flagstone or pavement; the former is by far the best, and to this a common metal stench-trap should be placed. This is in every respect the best. It admits of being taken up and replaced, for the purpose of cleaning out the sediment which will from time to time accumulate. Connected with this drain should be a tank; or it might communicate with the drainage of the rest of the buildings. The interior or covered shed should be kept constantly littered; and so indeed should be the court-yard, if the object of the pig-keeper be to convert his straw into manure. If not, it should be swept and washed clean, and occasionally sprinkled with fresh saw dust. There is no better absorbent—no cleanlier material than this, and it is cheaper than straw, when both have to be purchased, much more portable, easier obtained, carried or stowed away, and should be the sheet-anchor of the amateur pig-keeper.

Here is a general plan of such a piggery for those who fol-



A. Sties. B. Doors at back. C. Doors in the front, and troughs. D. Drain. E. Tank. The stream to the right can be admitted at pleasure, to pass through the piggery.

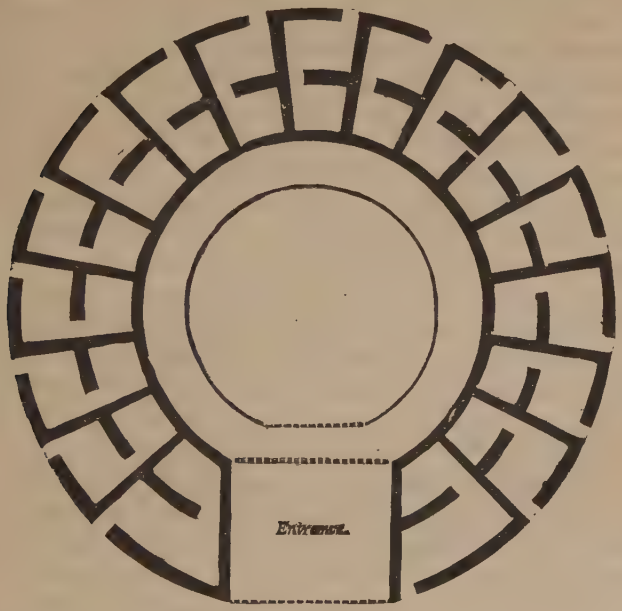
low this branch of rural economy on a moderately extensive scale.

The ground on which the piggery is established should likewise be divided into two parts by a drain, which should run

through it; and towards this drain each section should slope. This, the main drain, to which communication should be established from the other already described, should be carried beyond the fold, and fall into a large tank or pit formed for that purpose. The reasons for this recommendation will, of course, be obvious to every person. The object in view is a double one, viz.: at once to keep the pig-fold and sties in a clean and dry state, and to preserve the valuable liquid manure which comes from the animals you keep. The value of liquid manure has been for some years neglected or lost sight of. It is now becoming generally understood and recognized; and in no available instance should measures for its proper collection and preparation be omitted. There are some who will probably inquire whether it would not rather be better to suffer the moisture to soak into earth or straw, or other substances on the floor, so to speak, of the inclosure, and then to clear it all away periodically, then to drain off the liquid into a tank. For the information of such persons, it may be observed that by drawing off the liquid you add to the cleanliness of your swine, and, in proportion, to their health and capacity for thriving; and, also, that the collection of liquid manure into tanks is less troublesome than the removal of substances saturated with it from the floor of the fold would be. The liquid contained in the tank (if you keep cows, of course they contribute their quota as well as the pigs) is not to be applied to the land intended to be manured in a liquid state, but is previously to be absorbed by suitable composts. This subject, however, is altogether foreign to the design of the present work; and there are, besides, many treatises on this point easily procurable and perfectly intelligible. It is therefore unnecessary that we should here enter upon such a disquisition.

You should also have your sties so constructed as to admit of being closed up altogether when desirable; for swine, even of our hardiest breeds, are susceptible of cold; and, if they be exposed to it in severe weather, it will materially retard their fattening. The sty should be kept constantly supplied with clean straw. It will be found that carting the refuse into the tank will, in the form of manure, more than repay the value of the straw thus expended.

Exercise is as necessary for swine as it is for horses, and the manure heap in the yard will be benefitted by their rooting. The odd corns will be picked up, and the fermenting mass will form a warm and healthy bed, highly suited to the somnolent habits of the pig in winter. Where this is adopted, the circular range of houses here given is well adapted to the purpose.



DESCRIPTION.

This piggery suits the largest size of farms, on which the roots and crops are grown, to feed swine in large numbers. There are seventeen sties, with yards, to accommodate two animals in each division; the inner wall being six feet, and the front wall three feet, in height. The boar and brood sows will occupy three sties; and two lots of fat pigs yearly from the other sties will accommodate fifty-six animals

Points of a Good Hog.—It may not be amiss to group together what is deemed desirable under this head. No one should be led away by mere name in his selection of a hog. It may be called a Berkshire, or a Suffolk, or any other breed

most in estimation, and yet, in reality, may possess none of this valuable blood. The only sure way to avoid imposition is to make name always secondary to points. If a hog is found possessing such points of form as are calculated to insure early maturity and faculty of taking on flesh, one needs to care but little by what name he is called; since no mere name can bestow value upon an animal deficient in the qualities already indicated.

The true Berkshire—that possessing a dash of the Chinese and Neapolitan variety—comes, perhaps, nearer to the desired standard than any other.

The chief points which characterize such a hog are the following:—In the first place, sufficient depth of carcass, and such an elongation of body as will insure a sufficient lateral expansion. The loin and breast should be broad. The breadth of the former denotes good room for the play of the lungs, and, as a consequence, a free and healthy circulation, essential to the thriving or fattening of any animal. The bone should be small and the joints fine—nothing is more indicative of high breeding than this; and the legs should be no longer than, when fully fat, would just prevent the animal's belly from trailing upon the ground. The leg is the least profitable portion of the hog, and no more of it is required than is absolutely necessary for the support of the rest. The feet should be firm and sound; the toes should lie well together, and press straightly upon the ground; the claws, also, should be even, upright and healthy.

The form of the head is sometimes deemed of little or no consequence, it being generally, perhaps, supposed that a good hog may have an ugly head; but the head of all animals is one of the very principal points in which pure or impure breeding will be most obviously indicated. A high-bred animal will invariably be found to arrive more speedily at maturity, to take flesh more easily, and at an earlier period, and altogether to turn out more profitably than one of questionable or impure stock. Such being the case, the head of the hog is a point by no means to be overlooked. The description of head most likely to promise—or, rather to be the accompaniment of—high breeding, is one not carrying heavy bones, not

too flat on the forehead or possessing a snout too elongated; the snout should be short, and the forehead rather convex, curving upward; and the ear, while pendulous, should incline somewhat forward, and at the same time be light and thin. The carriage of the pig should also be noticed. If this be dull, heavy, and dejected, one may reasonably suspect ill-health, if not some concealed disorder actually existing, or just about to break forth; and there cannot be a more unfavorable symptom than a hung-down, slouching head. Of course, a fat hog for slaughter, and a sow heavy with young, have not much sprightliness or deportment.

Color is, likewise, not to be disregarded. Those colors are preferable which are characteristic of the most esteemed breeds. If the hair is scant, black is desirable, as denoting connection with the Neapolitan; if too bare of hair, a too intimate alliance with that variety may be apprehended, and a consequent want of hardihood, which—however unimportant, if pork be the object—renders such animals a hazardous speculation for store purposes, on account of their extreme susceptibility of cold, and consequent liability to disease. If white, and not too small, they are valuable as exhibiting connection with the Chinese. If light, or sandy, or red with black marks, the favorite Berkshire is detected; and so on, with reference to every possible variety of hue.

Breeding.—In the selection of a boar and sow for breeding, much more attention and consideration are necessary than people appear generally to imagine. With a very little judgment and management, and much less expense than is generally incurred, it as easy to procure a good breed as an inferior one; and, as the former is infinitely more lucrative and remunerative, in proportion to the outlay, than the latter can ever be, a little attention to the subject may be advantageous.

In choosing the parents of your future stock, you must diligently bear in mind the precise objects you may have in view, whether the rearing for pork or bacon; and whether you desire to meet the earliest market, and thus realize a certain profit, with the least possible outlay of money, or loss of time; or whether you mean to be contented to meet a heavier, although somewhat protracted return.

If bacon and the late market be your object, you will do well to select the large and heavy varieties, taking care to ascertain that the breed has the character of being at once possessed of those qualities most likely to ensure a heavy return, viz., growth, and facility of taking fat.

If, on the other hand, your object be to produce pork, you will, of course, find your account in the smaller varieties; such as arrive with greatest rapidity at maturity, and which are likely to produce the most delicate flesh. In producing pork, it is not advisable that it should be too fat, without a corresponding proportion of lean; and, on this account, we would recommend that you rather take a cross-bred sow than a pure Chinese stock, from which the over-fattening results might be naturally apprehended. The Leicester or Berkshire, crossed with Chinese, is about the best porker.

In every case, whether your object be pork or bacon, the points to be looked for are,—in the sow, a small, lively head, a broad and deep chest, round ribs, capacious barrel, a haunch, falling almost to the hough, deep and broad loin, ample hips, and considerable length of body in proportion to its height. Nor must the broad, flat, table-like back, the broad, thick, shoulders and ham be forgotten. The flesh should rise full and round behind the ears. One qualification should ever be kept in view, and, perhaps, should be the first point to which the attention should be directed, viz.: smallness of bone in proportion to the flesh, and fineness of the best parts, with lightness of offal.

Let the boar be less in size than the sow, shorter and more compact in form, with a raise and brawny neck, lively eye, small head, firm, hard flesh, and, if of the large breed, his neck well furnished with bristles. In other respects, look for the same points as described in reference to the sow. Breeding within too close degrees of consanguinity, or, as it is technically styled, breeding in and in, is sometimes said to be calculated to produce degeneracy in size, and also to impair the animal's fertility; it is certainly to be avoided where the breed is not of great culture, although some breeders maintain that a first cross does not harm; but, on the contrary, that it produces offsprings which are predisposed to arrive earlier at

maturity, and take fat with greater facility. This may, in some instances be the case; it is so with horned cattle,—but, as far as swine are concerned, it is a matter of some question, though it must be confessed the producers of the finest animals are very close breeders.

Differences of opinion exist as to the precise age of boar and sow at which breeding is most advisable. They will, if permitted, breed at the early age of six and seven months; but this is a practice not to recommend. Good advice is, to let the sow be at least one year old, and the boar at least eighteen months; but, if the former have attained her second year, and the latter his third, a vigorous and numerous offspring are more likely to result. The boar and sow retain their ability to breed for about five years; that is, until the former is upwards of eight years old, and the latter seven. We do not recommend using a boar after he has passed his fifth year, nor a sow after she has passed her fourth, unless she has proved a peculiarly valuable breeder; in which case she might be suffered to produce two or three more litters. When you have done with the services of the boar, have him emasculated—an operation that can be performed with perfect safety at any age—fatten and kill or sell him. When it is no longer desirable to breed from the sow, kill her also. Perhaps it is the most economical way, where the breeding and fattening of pigs are carried on simultaneously, to take no more than three litters from a sow before she is killed. If less are taken, she will not have arrived at her full maturity,—if more, she will be injured for bacon. A sow who has had but three litters, will be as fine bacon as an emasculated hog; but if she has more, she will be coarse and strong in flavor. Another objection to keeping sows to a great age is, that they usually become ravenous and voracious when they get old, and often take to the worrying of lambs and poultry. They are sometimes so gross and indolent as to lie upon their own offspring. Young pigs are likewise far more matronly and active, and their litters have more energy and vital power than those of older animals, though the number of their produce is often smaller.

If a sow be of a stock characterized by an unusual tendency to take on fat, it is well to breed from her at an early age (say

eight or nine months); for this tendency to fat in a breeding sow is highly objectionable, as materially conducing to danger in parturition. Let her have the boar a couple of months after pigging, and let her breed as frequently as she is capable of doing. This will effectually check the tendency to fat; and, after having taken a few litters from her, you will find that the rapidity with which she will feed will soon adapt her to the butcher. In the case of such a sow, do not give her the boar before putting her up to fatten; but as soon as she is so fat as to be within six or eight weeks of being fit for the butcher, she should be sent to the boar. The reasons for this are obvious. Once in three weeks she, being highly fed and in a very vigorous condition of body, becomes in season, frets, gets excited, is often off her food, and loses several days of fattening; and if you should wish to kill her during these seasons of excitement, or a few days before or after, there is every probability of her bacon becoming bad, or, at any rate, a certainty of its flavor being injured. To put to the boar when first put up to feed would be injurious, because the nutriment of the fœtus would abstract from the feeding of the mother, and it is best to risk the loss of the seasons of periodical disturbance; but later on gestation has a sedative effect, and no injury; but the greatest benefit will result from its having taken place in its early stages. It is manifest that any coarse, indifferent boar, in this case, will answer the purpose.

Feed the breeding boar well; keep him in high condition, but not fat; the sow, on the other hand, should be kept somewhat low, until after conception, when the quantity and quality of her food should be gradually and judiciously increased. The best times for breeding swine are the months of April and July or August. A litter obtained later than August has much to contend with, and seldom proves profitable. Some, indeed, state, that when such an occurrence does take place, whether from acident or neglect, the litter is not worth keeping. It is of little use, however, to throw anything away. Should you at any time have a late litter, leave them with the sow; feed both her and them with warm and stimulating food, and you will thus have excellent pork, with which to meet the the market when that article is at once scarce and dear, and

consequently profitable. By following this system of management you will not only turn your late litter to account, but actually realize almost as good a profit as if it had been produced at a more favorable season.

The period of gestation in the sow varies. The most usual period during which she carries her young is four lunar months, or sixteen weeks, or about one hundred and thirteen days.

The sow produces from eight to thirteen young ones at a litter; some times even more. A sow cannot give nourishment to more young than she has teats; and, as the number of teats is twelve, when a thirteenth little one is littered, he does not fare very well, having to wait until some one of his more fortunate brothers or sisters shall have had their fill. The sufferer on these occasions is, of course, the smallest and weakest. A too numerous litter are all generally undersized and weakly, and seldom or never prove profitable. A litter not exceeding ten, will usually be found to turn out most advantageously.

On account of the discrepancy subsisting between the number farrowed by different sows, it is a good plan, if it can be managed, to have more than one breeding at the same time, in order that you may equalize the number to be sucked by each. The sow seldom recognizes the presence of a strange little one, if it have been introduced among the others during her absence, and has lain for half an hour or so amongst her offspring in their sty .

Moubray gives a very remarkable instance of a sow, which sucked nineteen pigs at the one time. This is very unusual, and can only be accomplished by dividing the litter into two divisions, and turning the sow to each alternately. Much greater care is also necessary in such cases, both of the pigs and their mother, than when the litter is smaller; and they require a warm house, amply, but not over littered, with fine, fresh hay. As soon as the inflammatory stage of pigging is over the mother must also be kept on the most nourishing food. Neither new milk, bean meal, oatmeal, nor any other nourishing food must be grudged; for if it be worth while to keep the animals at all, it is desirable to sustain them as well as possible.

Parturition.—The pig suffers the least from parturition,

and is the easiest delivered, of all domestic animals. She usually shows symptoms of uneasiness first by great anger at all other pigs within her reach, by collecting straw in her mouth, and carrying it to a remote corner of the yard in which she is running loose. She must not be stopped here. This wild instinct can be satisfied only by exhaustion. When the bed is made she must be removed to a rather dark house, well screened on every side, and about eight or nine feet square, so that she may have ample room to lie and turn in every direction. One of the best contrivances is to have a lath run round the house, six inches from the ground and six from all sides of the house, well stayed below and on each side by perpendicular and horizontal pieces of wood. She will thus be unable to lie close to any one side of the house, and cannot thereby crush to death any of her offspring during the throes of parturition.

A little attention will be necessary, in the first stage, to see that the delivery is perfect. She must be, at all events, kept lying as still as possible, unless she needs help, which will not take place in one case in a thousaud. These cases do, however, occur; and as works on this matter are scarce, a few words may be acceptable. The difficulty can only occur in one of three ways, viz., a false presentation, a sinking of the pig into the uterus instead of its being presented in the vagina, or a contracted orifice. In the latter case a veterinary surgeon of correct anatomical knowledge, is utterly indispensable.

The most usual false presentation is when the pig comes sideways, and so chokes the passage. Here a mere turn with the hand, as soon as the effort has ceased, will set all right. If the pig has sunk down, it may be necessary to use more care; the best and safest plan is, to have a child's hand introduced, to raise up the young animal to its proper position. This will succeed when all other methods will fail. As soon as each pig is delivered it should be placed before its mother, and it will soon begin to select its teat. Once selected, it will generally keep to it, if its right is not disputed by a stronger brother. In this case, as in others, the "weakest goes to the wall," and the weakest pig has to take to the first or last brace of teats, which are the least productive of milk. Thus the smallest and weak-

est are kept down. If any pig should be very weak, and the weather should be very cold, it may be taken near the fire and wrapped in flannel. This usually restores vigor. Some parties so confine all the first littered animals, when there is an apprehension of a scarcity of milk. This is by no means a bad contrivance.

As soon as the pigging is over, she will begin to cleanse—or, in other words, eject the placenta. This is usually as easily got over as farrowing; but a little more watching will be necessary than even in pigging. It should be immediately removed, or she will begin to eat it, and may be thus taught to devour poultry, lambs, and very probably her own produce.

As parturition usually produces thirst, let the sow have a quart of slightly warmed milk, and thickened with a little bran. This quenches thirst, keeps off constipation, and is one of the finest of medicines. As soon as she has cleansed, and all the young ones have been suckled, she should be gently driven out to stale; for such is the cleanliness of the pig, that she would damage herself, if she was not taken out, rather than spoil her bed by staling, or disturb her young ones. A little care of her bowels, plenty of bran and milk food, given in small quantities, frequently turning out for short periods in a sheltered place, will be necessary at first. If much fever or constipation should take place, a little sulphur—two heaped teaspoonfuls—in her milk will relieve her; nor will she refuse the milk which contains it, if it be thickened with a little wheat meal. Barley, and even oatmeal, must be avoided for the first three or four days. Afterwards she may have any kind of food whatever, except meal, which, useful as it is to store pigs, should never be given to those which are suckling.

Feeding.—So long as the sow is carrying her young, feed her abundantly, and increase the quantity until parturition approaches within a week or so, when it is as well to diminish both the quantity and quality, lest the acquisition of fat should be productive of danger; but while she is giving suck you cannot feed too well. You may wean the young at eight weeks old, and should remove them for that purpose from the sow. Feed them well, frequently, abundantly, and sufficiently—but not more—on moist, nutritious food, and pay particular atten-

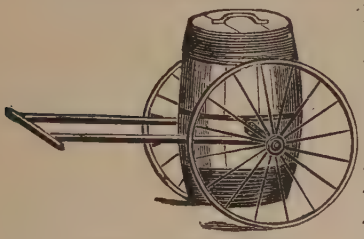
tion to their lodgmeut. A warm, dry, comfortable bed is of fully as much consequence as feeding, if not even of more. Should the sow exhibit any tendency to devour her young, or should she have done so on a former occasion, strap up her mouth for the first three or four days, and only release it to admit of her taking her meals. Some sows, as we have said, are apt to lie upon and crush their young. This may be best avoided by not keeping the sow too fat or heavy, and by not leaving too many young upon her. Let the straw forming the bed also be short, and not in too great quantity, lest the pigs get huddled up under it, and the sow unconsciously overlie them in that condition.

The young pigs should be gradually fed before perfectly weaning them; and for first food nothing is so good as milk, which may be succeeded by ordinary dairy wash, thickened with oat or barley meal, or fine pollard; this is better scalded, or, better still, boiled. To the sow some dry food should be given once daily, which might consist of peas or beans. Swedish turnips, carrots, parsnips, or the like, either well boiled or raw, may be given; but the food should be always boiled, or, what is better, steamed. Some wean the pigs within a few hours after birth. It can hardly be conceived under what circumstances this may be found advantageous; but the best mode of management is clearly to turn the boar into the hog yard a month or two after parturition, at which time it is proper to remove the sows for a few hours daily from the young, and let them accept their overtures when they please. It does not injure either the sow or her young if she take the boar while sucking; but some sows will not do so until the cessation of their milk, and this is much more natural.

Swill Barrels and Troughs.—In some convenient place, near the pig pens, there should be a receptacle for the wash from the house, milk, whey, waste vegetables, and other refuse. This is often nothing more than an old pork or cider barrel. It is difficult to conceive of anything more inconvenient. It is too high, and too circumscribed. A far more convenient and inexpensive arrangement is to make a tub out of two-inch pine planks—say six feet long, two and a half wide, and two feet, or two and a half or three feet high—according to the number

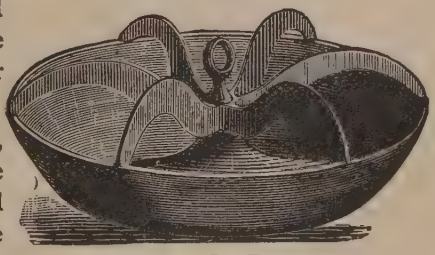
of pigs kept. Or, what is better still, make such a tub out of plank twelve feet long, and have a partition in the middle. In this way you have two tubs in one. The food for the store pigs can be kept in one, and that for the fattening pigs in the other. It is desirable to have two such tubs, each twelve feet long, and divided in the middle. Such tubs are often made flaring, being wider at the top than at the bottom. It should be put on with hinges, and made of planed and matched inch boards, and divided in the center of the tub, so that one part may be closed while the other is open, if desired.

At the house, a barrel should be placed in some convenient place, for the reception of all dish-water and refuse. If this barrel is set on wheels, as shown in the engraving, it can be easily conveyed to the pig pens, and emptied into one of the tubs above described. It should then be mixed with a little meal, and allowed to remain until the particles of meal become quite soft. It is then much more easily digested. If a slight fermentation takes place, by which the starch of the meal is converted into sugar, and a little of it into alcohol, the pigs appear to relish it all the better. A small amount of meal fed to store pigs in this manner, in summer, enables us to obtain much more benefit from the milk, whey, and house wash than when fed alone. Every pig pen should be provided with two troughs—one for food, and the other for water.



PORTABLE SWILL BARREL.

Cast-iron pig troughs, of different patterns, are sold at the agricultural implement stores. One of them is shown in the cut; the weight of the one figured is one hundred and ten pounds.



CAST-IRON PIG TROUGH.

Castration.—In castrating hogs, let a person grasp the

young pig, which should be from fourteen to twenty-one days old, by both its hind legs, with its face to the person, and so as to expose the tests on a level with the hands of the operator. The skin of the tests is loose; and, with a lancet, or sharp round-pointed knife—the latter being generally adopted—a longitudinal cut is given to the scrotum over each of the testes. The finger and thumb are then pressed gently on each side of the incision, until the testes protrudes, which is then grasped gently by the other hand, and the spermatic cord separated by the knife. The operation is very rapidly done, and need not occupy more than three minutes. It is desirable that the pigs should fast a few hours after the operation; but they seem to suffer so little from it, that they will seldom be even stiff the next morning.

When the pig is a greater age, the operation is one of greater difficulty; with the aged boar, especially, it is a very difficult affair, as he cannot be held up in the way the young pigs can under a month old. It is thus necessary to lay him on his side, and have him well secured before the operation is performed. He should also fast a little before the operation, as well as the following night, and be supplied only with bran and milk after. Sows in season should be kept from him till the wound is healed.

There is more difficulty, however, in performing the operation, either in the old or young, where there is a rupture, which is not unfrequently the case. Greater care must be taken in making a perfectly clean cut. The pigs should fast a day before, and a night, at least, after the operation; and the scrotum should be carefully stiched up after the operation, otherwise inflammation will ensue.

Spaying.—The spaying of female or gilt pigs, is a more difficult operation, and requires generally much more care. An ignorant operator often makes sad mistakes, and frequently produces irremediable injury. The operation is usually performed when about three weeks old, and the whole litter is cut at prices varying, in different localities. The animal is first laid on its right side, so that the left, or near side, is upwards. The two hind legs are stretched out straight, so as to present the mid-flank fully exposed to the operation. An incision,

about two inches long, is then made with the round-pointed knife, and the tumb and finger are introduced to search for the ovaries, which are easily found, from their being separate at one end and presenting a convoluted or knotted appearance to the eye. These are collected together, and folded over the edge of the wound downwards, and when the operator is satisfied that all are exposed, he cuts them by a little pressure of the knife towards the skin, and the uterus falls back into its place. He then proceeds to stitch up the orifice with three or four stiches. A little fasting for a short time is generally required, especially from large quantities of liquid food, and they usually very soon recover. The only care the operator has to take, is to clean his knife well after every cut, to secure the whole of the ovaria, and to avoid stiching up any of the intestines with the skin. If this be done, death is almost certain to follow. Though an operation usually performed at or before a month old, both spaying and castrating may be safely done at any reasonable age of the animal.

Weaning.—This usually takes place at six or eight weeks old. Long before this, a little new milk, or boiled skim-milk, should be placed before them, and they will soon be taught to drink. Hence the weaning, when it takes place, will be a much smaller privation to animals; and they will scarcely ever know it, if they previously eat well and have plenty of milk, with a little barley or bran meal.

At weaning time the young pigs may be rung. This operation must, of course, be to a certain extent a painful one, but, perhaps, scarcely so much so as the noisy demonstrations on the part of the little sufferers would seem to indicate. No young animals like to be rudely meddled with, and of all animals, the pig is about the least manageable as a patient. Ringing, is, however, absolutely necessary, unless the cartilage of the nose be cut away, a practice resorted to in substitution for it in some parts of the country. The latter practice is, however, far more cruel than ringing, and its efficacy is stated by many to be at the best questionable. A sow in pig should never be rung; it often produces epilepsy in the young pigs.

After about five weeks' high and careful feeding, subsequent to weaning, the young pigs may be put up for stores,

porkers, etc., according to the owner's views respecting them. Very young pigs, indeed, immediately after being weaned, if fed on the refuse of a dairy, will be brought up for delicious pork in five or six weeks; for the last week prior to killing, the addition of beans, peas, or bruised corn, will impart a degree of firmness to the flesh, which is considered an improvement. This is called "dairy fed pork," and it never fails to fetch an enhanced price, thereby amply remunerating the producer.

Fattening.—Pigs designed for pork should not be fattened to the same extent as those designed for bacon. Porkers, when intended for domestic use, may be allowed to run at large. Grazing, or the run of a wood in which roots or nuts may be met with, is calculated, in an eminent degree, to improve the quality of their flesh. Of course, it will be necessary to give the pigs regular meals, independently of what they can thus cater for themselves; and the hours for so doing should be in the morning, before the pigs are let out, and in the evening, before they are returned to the sty. Pigs are more sagacious than they generally obtain credit for. They speedily become habituated to the afternoon hour of feeding, and regularly resort to the sties for their accustomed dinner, thus saving considerable trouble that would otherwise arise from the necessity of collecting and driving them home. But when pork feeding is carried on solely for profit, there can be no question that the sty is the only place where they should be kept. For the period they are confined, the want of exercise, even in young animals, does not at all interfere with their health, and they will lay on fat much more speedily and easily if they are confined. Sleep seems to be as necessary to the pig for fattening even as food. Hence, a warm, comfortable bed of hay will always compensate the pork-feeder, and so will a supply of earth, or, what is even better, small coals. When confinement is adopted, this is absolutely necessary; and the want of this is often so great that the sty is rooted up, and even the walls are attacked. When these symptoms take place, it is by no means indicative of a depraved appetite, to which the habit is generally attributed, but to a want of management in supplying edible alkalies to the animal to neu-

tralize the acid and assist digestion. Too many swine should not be kept in one sty; and if a young one appears at any time to have become an object of persecution to the rest, he should be withdrawn. The introduction of strangers should likewise be avoided.

Bacon pigs fatten best by themselves. They need no liberty; and it is only necessary to keep the sty dry and clean, and to feed abundantly, in order to prepare them for the knife. In order to fatten a pig, his comfort must, in every respect, be attended to; and there cannot be a more gratifying sound to the ears of the zealous pig-feeder than that peculiar self-satisfied, contented grunt, with which the huge hog, basking, perhaps, beneath a summer's sun, announces to his admiring owner that all his wants and wishes have been gratified. This is the never-failing omen of success, and you may look for such weight and condition as will bring to your purse the remunerative commendation you have earned.

Professor Johnston, who may always be safely quoted on all matters of agricultural science, gives a table of the comparative nutritive elements of different kinds of food, and from which we select those materials used in pig-feeding, omitting the parts of the table not applicable:

Heat-producing. Starch, Sugar, Gum, &c.		Flesh-and-bone-producing. Gluten, albumen, legumen, &c.		Fat-producing. Fatty matter—per cent.	
Wheat	55	Wheat	15	Wheat	3
Barley	60	Barley	14	Barley	2
Oats	60	Oats	16	Oats	6
Rye	60	Rye	13	Rye	3
Indian corn	70	Indian corn	12	Indian corn	7
Rice	75	Rice	7	Rice	0.7
Beans	49	Beans	26	Beans	3
Peas	50	Peas	24	Peas	2.1
Potatoes	18	Potatoes	2	Potatoes	0.3
Turnips	9	Turnips	1.5	Turnips	0.3
Carrots	10	Carrots	1.5	Carrots	0.4
Mangel wurzel	11	Mangel wurzel	2	Mangel wurzel	

Now, as it is generally economical to combine roots with grain, potatoes are the most useful as a root and oats as a grain; and, therefore, they are usually selected by the best pig-feeders, and are the usual aliments where large and fat pigs are the desiderata.

Wheat meal, now that grain can be purchased, husk and flour, cheaper than before, is by far the cheapest of all kinds

of grain; but it is hardly so well relished as oatmeal, because it adheres, from its glutinous character, to the teeth of the animals, and thus annoys them; and all disturbances invariably do harm to fattening animals.

For store pigs nothing more will be requisite than the pickings of the fold-yard (especially where cattle are fed on linseed cake, for they will carefully collect all the dung in this case and feed upon it), with a few chopped turnips and a little sour wash in winter. In summer they may run out in the grass-fields, and have a little wash, in which almost any refuse may be thrown. A very carefully selected breed of pigs were fattened on nothing but grass and water in several cases. As the pastures fail, and before the stubbles are ready, a handful of old dry beans in the morning, per animal, will exercise a very wonderful influence for the better; the binding character of the beans will counteract the too relaxing wash and grass; and, when the harvest is over, the stubbles are a very valuable auxiliary. When these are finished, the pigs should at once be put up to feed; and at first a large quantity of roots may be given. It is a great satisfaction, then, that diseased potatoes will not only have no injurious tendency on either the live animal or its bacon, but will be almost, if not altogether, as fattening as when they are sound. Hence the value of a stock of pigs.

As the feeding progresses, barley or oatmeal should be given in increasing proportions; and, as the process becomes more nearly completed, the whole of the roots may be abstracted with advantage. Boiling and steaming the food is absolutely essential to pigs.

The digestive powers of the pig are by no means strong. They partake of the sluggishness of his general organism. Hence he must have his roots broken down by steam or boiling, and his grain not merely crushed, but absolutely made into flour. He will feed better also on slop food, which has undergone one process of decomposition—fermentation—than when it is fresh.

Those who make pig feeding a business, and consequently keep a number of these animals, should so manage as to be enabled to provide for their maintenance and fattening from

the produce of their crops. They should therefore cultivate for pig-feeding, beans, peas, barley, buckwheat, potatoes, flax, parsnips, carrots, cabbage, lettuce, Lucerne, Italian rye-grass, clover, rape, chicory, and vetches; they should also sow thistle —which is a most nutritious article of diet for pigs, but so much neglected that it is as yet scarcely ever to be met with in a state of cultivation, or in any condition but that of a weed.

Ere leaving this subject, we must mention one practice, too little known, or too much neglected by swine-feeders—a practice, also, that will be found to conduct materially to that great object of all swine-feeders, the production of bulk and weight at the lowest possible outlay. The practice is washing. A hog washed weekly with soap and a brush will be found to thrive, and put up flesh in a ratio of at least five to three, in comparison with a pig not so treated. This fact has been well tried. There can be no possible question about its correctness; and the duty is not a very difficult matter to perform—for the swine, as soon as they discover the real character of the operation, are far from being disposed to resist; and after a couple of washings they submit to the ceremony with the best grace imaginable.

In conclusion, we would request the reader to observe a few cautions in conjunction with the directions already given relative to feeding.

Avoid foul feeding. No feed fit for the table can proceed from unclean feeding.

Add salt in moderate quantities to the mess given; you will find your account in attending to this.

Feed at regular intervals. Nothing is more essential to a healthy animal.

Cleanse the trough previous to feeding, by washing out carefully. Without this precaution all other attempts at cleanliness will be in vain.

Do not overfeed; give only as much as will be consumed at the meal. Never allow any to remain in the trough; clean it out for the store pigs.

Vary your bill of fare. Variety will create, or, at all events, increase appetite, and it is farther most conducive to health. Let your variations be guided by the state of the dung

cast; this should be of medium consistence, and of a greyish-brown color; if hard, increase the quantity of bran and succulent roots; if too liquid, dimish or dispense with bran; give beans or acorns, and let the mess be firmer. If you can add a portion of corn, that which is spoiled, and thus rendered unfit for other purposes, will be found to answer perfectly well.

FEED YOUR STOCK SEPARATELY, in classes, according to their relative conditions; keep sows in young by themselves; stores by themselves; and bacon pigs and porkers by themselves. It is not advisable to keep your stores to high in flesh; for high feeding, however strange it may seem, is calculated to retard development of form and bulk. It is better to feed pigs intended to be put up for bacon, loosely, and not too abundantly, until they have attained their full stature. You can then bring them into the highest possible condition in an inconceivably short space of time. It is by such a system of management as this that the monstrous swine are raised—their weight frequently exceeding twelve hundred pounds, or, at all events, half a ton.

DO NOT REGRET THE LOSS OR SCARCITY OF POTATOES so far as swine-feeding is concerned. The potato is capable of being replaced; and its loss has been the means of stimulating inquiry, and producing experiment, which has resulted in the discovery that many other useful vegetables have been hitherto neglected, and foolishly passed aside.

DO NOT NEGLECT TO KEEP YOUR SWINE CLEAN, DRY, AND WARM. These are essentials, and not a whit less imperative than feeding; for an inferior description of food will, by their aid, succeed far better than the highest feeding will without them; and while we speak of cleanliness, suffer us to reiterate the benefit derivable from washing your pigs; this will repay your trouble manifold. They are always washed for agricultural shows, where they must be exhibited fat.

WATCH THE MARKETS. Sell when you see a reasonable profit before you. Many a man has swamped himself by his avidity, and by desiring to realize an unusual amount of gain. Recollect how very fluctuating are the markets, and that a certain gain is far better than the risk of loss. Even great capitalists have fallen from over-avidity. Do you recollect two

homely proverbs, but not the less true:—"Make your hay while while the sun shines;" and "A bird in the hand is worth two in the bush."

Slaughtering.—A pig that is to be killed should be kept without food for from twelve to sixteen hours previous to slaughtering; a little water must, however, be within his reach. He should, in the first place, be stunned by a blow on the head. Some advise that the knife should be thrust into the neck so as to sever the artery leading from the heart; while others prefer that the animal should be stuck through the brisket in the direction of the heart—care being exercised not to touch the first rib. The blood should then be allowed to drain from the carcass into vessels placed for the purpose; and the more completely it does so, the better will be the meat.

A large tub, or other vessel, has been previously got ready, which is now filled with boiling water. The carcass of the hog is plunged into this, and the hair is then removed with the edge of a knife. The hair is more easily removed if the hog is scalded before he stiffens, or becomes quite cold. It is not, however, necessary, but simply brutal and barbarous, to scald him while there is yet some life in him. Bacon-hogs may be singed by enveloping the body in straw, and setting the straw on fire, and then scraping it all over. When is this done, care must be observed not to burn or parch the cuticle. The entrails should then be removed, and the interior of the body well washed with lukewarm water, so as to remove all blood and impurities, and afterward wiped dry with a clean cloth; the carcass should then be hung up in a cool place for eighteen or twenty hours, to become set and firm.

For cutting up, the carcass should be laid on the back, upon a strong table. The head should then be cut off close by the ears, and the hinder feet so far below the houghs as not to disfigure the hams, and leave room sufficient for hanging them up; after which the carcass is divided into equal halves, up the middle of the back-bone, with a cleaving knife, and, if necessary, a hand-mallet. Then cut the ham from the side by the second joint of the back-bone, which will appear on dividing the carcass, and dress the ham by paring a little off the flank, or skinny part, so as to shape it with a half round point,

clearing off any top fat which may appear. Next cut off the sharp edge along the back-bone with a knife and mallet, and slice off the first rib next the shoulder, where there is a bloody vein, which must be taken out, since, if it is left in, that part is apt to spoil. The corners should be squared off when the ham is cut. The ordinary practice is to cut out the spine or back bone. Some take out the chine and upper parts of the ribs in the first place; indeed, almost every locality has its peculiar mode of proceeding

Pickling and Curing.—Bacon.—This is cured in very different ways. For domestic use, it is usually laid upon a table, and salt, with a little nitre, added, well rubbed in, first on one side and then on the other, either with the bare hand or the salting glove. Some straw is then placed on the floor of an outhouse, a flitch is laid thereon, with the rind downwards—straw laid upon this, then another flitch, and so on. Above the whole is placed a board, and heavy stones or weights above all. In three weeks or a month the meat is sufficiently salted and is hung up to hooks in the kitchen rafters. The general practice of burning wood and turf in some kitchens imparts a sweetness to the bacon thus saved that is not to be met with in any which you can purchase.

Another mode is as follows: Prepare a pickle, by boiling common salt and nitre in water; mix, for a single pig of tolerable size, one pound of coarse brown sugar with half a pound of nitre, and, by mixing all the sugar and nitre you require to use in the first instance, you will prevent its being purloined by children or servants; rub this well in with the salting gloves; then put the meat into the pickle, and let it lie in this for two days; afterwards take it out of the pickle, and rub it with salt alone; then put it back into the pickle.

For a Mild Cure.—Form sweet pickle by boiling molasses with salt and water; rub the meat with sugar and nitre; add a small portion of strong pickle to the meat; put the meat into this, and let it lie in it for three weeks. If there be any spare room in the cask, fill it up with molasses. Eight pounds of salt, one pound of nitre, and six pints of molasses, will about suffice for each hundred weight of meat, and will take about five gallons of water. In about three weeks—less or more

time being required according to size—take the meat out of pickle, and hang it in the drying house. While in the drying house the flitches should be hung neck downwards. You may cut out the ham and trim the flitch according to fancy. Nearly every county has, in this respect, a fashion of its own. Then, if you possess the means, remove your hams and bacon to the smoking house. They should not be suffered to touch each other. With this precaution you may hang them as closely as you please. Some houses are of every dimension; but the smallest answer as well as the most extensive. Before suspending the meat in the smoke house, it should be previously well rubbed over with bran. The fire is made of saw-dust, which burns with a low, smouldering glow, giving out far more smoke than if actually flaming. In the process of smoking, your meat will lose from about fifteen to twenty pounds per hundred weight—a fact necessary to be borne in mind.

Sometimes the pigs are killed before they arrive at full size, and their hair removed by singing; the bacon and hams of these are said to possess peculiar delicacy of flavor.

The best saw-dust for smoking hams or bacon is that made from oak, and it should be thoroughly dry. The saw-dust of common deal imparts a flavor of a disagreeable character, not unlike that of red herrings.

Westphalian Hams.—The genuine Westphalian bacon is particularly good; but all sold under that name is not genuine. In London, especially, spurious Westphalian hams are manufactured to a considerable extent. The process of imitation is not difficult, and none but one of the trade can detect the imposture. The fine quality of Westphalian bacon depends on several causes; the healthy and semi-wild life the swine are permitted to enjoy—their relationship to the wild boar—and not being fattened to the fullest extent previous to the killing. A large portion of sugar and juniper-berries are used in curing, the proportion being usually one and one-half pounds of sugar to three of salt, and two ounces of nitre. The smoke is also applied in a cold state. This is, perhaps, the principal secret. The hams are hung at the top of a very lofty building, and by the time the smoke reaches them it is perfectly cold.

The ham of the Westphalian hog closely resembles that of

the common old Irish breed; and the hams of that animal, when cured as has been described, could not be distinguished from those of Westphalian by the nicest judges, and are, therefore, sometimes used to deceive.

Yorkshire Bacon.—There are few counties where, upon the whole, a finer kind of bacon is procured than in this large county. Commencing by a pure breed—fed by farmers in the corn districts, and dairymen in the grazing valleys, on the very best milk and barley, with a small proportion of potatoes—it has none of those rancid and disagreeable flavors so often applying to Irish and American bacon. The mode of curing adopted is the following:

The pig, after hanging twenty-four hours, is thoroughly stiffened, and is then cut up in the ordinary mode. The shoulders are carefully searched for the large veins which proceed from the jugular, and, as the last blood is frequently found in these veins, they are carefully extracted with a fork. The bacon is then removed to leaden bowls—salt wiped over the smooth side—the shanks carefully stopped for four to six inches deep with salt and saltpetre. This is one of the most important facts in curing bacon. The skin side is then laid downwards, and the whole flesh side covered with salt, and sprinkled with saltpetre. The same applies to the hams and the other sides, and the proportion of coarse salt—which is always used for the purpose in preference to the more finely powdered—allowed for a twenty stone pig, is one stone of salt and one pound of saltpetre; and so on in proportion. Two or three pigs may be laid in a leaden bowl exposed to a north aspect, with plenty of air, and in a clean place, especially free from putrifying matter. In three days all the sides are removed, the bottom ones placed uppermost, and the whole of the bare places in the flesh side are again covered with salt. In this way it is removed three or four times in a month, during which time it is said to be in pickle. At the end of this period it is taken out of the leaden bowl, set on an edge, and wiped with a cloth to dry off the extraneous salt. It is hung for three weeks more in the kitchen, and is then fit for storing away. This is generally done in sacks, strewed with bran, where it remains until taken out for use.

Limerick and Belfast Hams.—Limerick and Belfast hams are cured in the following manner: They are, as we have said, cut fresh from the pig, with the hip-bones left in them, and are placed on a flagged floor, the front of the second ham resting upon the shank of the first, and so on until all are placed; they are then sprinkled with strong pickle from a watering-pot, and a small quantity of salt is shaken over them. Next day the hams are taken up, well rubbed with salt and laid down as before, when saltpetre is shaken over them in quantities proportionate to their size; they are left so for two days, and then taken up and rubbed as before, when they are laid down again, according to the space they have to fill—from three to six hams in height, with layers of salt between. After six days, the hams are reversed in the piles; that is, those that were packed on the top are put at the bottom. They then remain for six days longer in the pile, when they are considered cured. They are then taken up and washed, and hung up to dry in the air. When they are to be smoked, they are placed in a house for that purpose, and smoked—in Belfast, with wheaten straw and saw-dust; in Limerick, with peat or turf.

DISEASES AND REMEDIES.

PIG TIED FOR "DRENCHING."

Drenching Pigs.—A common form of administering medicine to cattle, sheep and pigs, is by "drenching" them. The

medicinal ingredients of the "drench" are mixed with some fluid, as ale or some sort of gruel, and the mixture is usually administered by means of a horn, the base of which is cut off diagonally, so as to produce a large opening. The head of the animal is raised a little by an assistant, while the operator pulls away the cheek of the right side of the mouth, which forms a pouch or pocket, and into this the medicine can be poured without any danger of causing suffocation. Owing to their obstinate and contrary character, there is generally considerable more difficulty in drenching pigs than any other domestic animal. When small, the animal is usually seized by the ears, placed between the holder's legs, and the fore legs are raised a few inches from the ground. Another person, having the medicine properly mixed in a basin or other vessel, pours a quantity of it from time to time into the pig's mouth by means of a large spoon. The slight elevation forward at which the animal is held causes the liquid to flow backward and be swallowed without risk of choking. Larger animals are fastened to a post or rail by means of a running noose, as illustrated. Here the medicine is poured into the mouth on the right side, as in the case of the smaller pigs, the cord being raised with the left hand whenever the head has to be elevated. By this means, although the beast's dissatisfaction finds utterance in loud and frequent screams, the medicine can be readily administered.

Catching the Pig.—Swine are very difficult animals to obtain any mastery over, or to operate on, or to examine. Seldom tame, or easily handled, they are at such periods most unmanageable—kicking, screaming, and even biting fiercely. The following method of getting hold of them has been recommended: Fasten a double cord to the end of a stick, and beneath the stick let there be a running noose in the cord; tie a piece of bread to the cord, and present it to the animal; and when he opens his mouth to seize the bait, catch the upper jaw in the noose, run it tight, and the animal is fast.

Another method is to catch one foot in a running noose suspended from some place, so as to draw the imprisoned foot off the ground; or, to envelop the head of the animal in a cloth or sack.

All coercive measures, however, should, as far as possible, be avoided, for the pig is naturally so averse to being handled that in his struggles he will often do himself far more mischief than the disease which is to be remedied or investigated would effect.

Bleeding.—The common mode of drawing blood from the pig is by cutting off portions of the ears or tail; this should

only be resorted to when local or instant blood-letting is requisite. The jugular veins of swine lie too deep, and are too much imbedded in fat, to admit of their being raised by any ligature about the neck; it is, therefore, useless to attempt to puncture them, as it would only be striking at random.

Those veins, however, which run over the interior surface of the ear, and especially towards the outer edge, may be opened without much difficulty; if the ear is turned back on the poll, one or more of them may easily be made sufficiently prominent to admit of its being punctured by pressing the fingers on the base of the ear near to the conch. When the necessary quantity of blood has been obtained, the finger may be raised, and it will cease to flow.

The palate veins, running on either side of the roof of the mouth, are also easily opened by making two incisions, one on each side of the palate about half way between the centre of the roof of the mouth and the teeth. The flow of blood may be readily stopped by means of a pledget of tow and a string, as in bleeding the horse.

The brachial vein of the fore leg—commonly called the plate-vein—running along the inner side under the skin, affords a good opportunity. The best place for puncturing it is about an inch above the knee, and scarcely half an inch backward from the radius, or the bone of the fore-arm. No danger need be apprehended from cutting two or three times, if sufficient blood cannot be obtained at once. This vein will become easily discernable if a ligature is tied firmly around the leg just below the shoulder.

This operation should always be performed with the lancet if possible. In cases of urgent haste, where no lancet is at hand, a small penknife may be used; but the fleam is a dangerous and objectionable instrument.

Cleanliness.—This is the great point to be insisted upon in swine management; if this, and warmth, be duly attended to, the animal will not, in one case in a hundred, become affected with any ailment.

The pig-feeder will find that in most cases his pigs will never ail anything from their birth to their slaughter. There may be a few attacked with disease; but the feeder will generally find that the first symptoms of it will give way before a dose of flour of sulpur—say half an ounce for a large animal, combined with new milk, which he will generally drink,—with warmth and confinement. As it is almost impossible to administer medicine by force, it is better thus to take the disease in its first stage, and give it them by enticement.

As, however, even under the most careful system of management, an occasional disappointment may occur, the reader

is furnished with the following brief view of the principal complaints, by which some are, under the most unfavorable circumstances, liable to be attacked, and also with the plainest effectual mode of sanatory treatment to be adopted:

Fever.—The symptoms are redness of the eyes, dryness and heat of the nostrils, the lips and the skin generally; appetite gone, or very defective, and the presence, usually, of a very violent thirst. Of course, no symptom can be regarded as individually indicative of the presence of any particular disease; these, which we have named, might, individually, indicate the presence of many other diseases, nay, of no disorder at all, but, collectively, they point to the presence of fever as their origin.

TREATMENT.—Let the animal, as soon as possible after the appearance of these symptoms, be bled, by cutting the veins at the back of the ears. The pressure of the finger raises the vein, and you can then puncture it with a lancet. If the bleeding from this channel be not sufficiently copious, you must cut off a portion of his tail; and, after bleeding, let him be warmly housed; but, at the same time, while protected from colds and draughts, let the sty be well and thoroughly ventilated, and its inmate supplied with a constant succession of fresh air. The bleeding will usually be followed, in an hour or two, by such a return of appetite as to induce the animal to eat a sufficient quantity of food to admit of your making it the vehicle for administering such internal remedies as may seem advisable. The best vehicle is bread, steeped in broth. The pig, however, sinks so rapidly, when once he loses his appetite, that no depletive medicines are in general necessary or suitable. The fever will usually be found to yield to the bleeding, and your only object need be the support of the animal's strength, by small portions of nourishing food frequently administered.

Do not, however, at any time suffer your patient to eat as much as his inclination might prompt; the moment he appears to be no longer ravenous, remove the mess, and do not offer it again until after a lapse of from three to four hours.

It is a singular fact, that as the hog surpasses every other animal in the facility with which he acquires fat, he likewise surpasses all others in the rapidity with which his strength becomes prostrated when once his appetite deserts him. The French veterinarian practice recommends the addition of peppermint to the bread and broth. If the animal be not disgusted by the smell, it may be added; and, if the bowels be confined, the addition of castor and (unboiled) linseed oil, in equal quantities, and in the proportion of two to six ounces, according to the size of the pig, should not be omitted.

If you find yourself unable to restore the animal's appetite,

the case is nearly hopeless, and you may legitimately regard its return as one of the most infallible symptoms of returning convalescence.

Leprosy.—The fact of the pig being subject to leprosy was by some persons supposed to be the reason for the Divine prohibition of pig's flesh to the peculiarly chosen Jews, as they were themselves subject to it in no small degree. Be this as it may, however, it often attacks the swine in very hot seasons in this country, where man is free from its ravages.

Symptoms.—The symptoms of this complaint usually commence with the formation of a small tumor in the eye, followed by a general prostration of spirits; the head is held down; the whole frame inclines toward the ground; universal languor succeeds; the animal refuses food, languishes, and rapidly falls away in flesh; blisters soon make their appearance,beneath the tongue, then upon the throat, the jaws, the head, and the entire body. The flesh of a leperous pig is said to possess most pernicious qualities, and, independent of our disgust, to be wholly unfit for human food. If the animal be killed in the very first stage of the disease, however, the affection is only superficial, the flesh nothing the worse, but rather improved in tenderness, and, indeed, not to be distinguished from that of a perfectly sound animal.

Treatment.—The cause of this disease is want of cleanliness, absence of fresh air, want of due attention to ventilation, and foul feeding. The obvious cure, therefore, is—first, bleed; clean out the sty daily; wash the affected animal thoroughly with soap and water, to which soda or potash has been added; supply him with a clean bed; keep him dry and comfortable; let him have gentle exercise and plenty of fresh air; limit the quantity of his food, and diminish its rankness; give bran with wash, in which you may add, for an average-sized hog, say one of twenty stone (8 lbs. to the stone), or 160 lbs. weight, a tablespoonful of the flour of sulphur, with as much nitre as will cover a sixpence, daily. A few grains of powdered antimony may also be given with effect. The animal, if in summer, should be kept in the shade, and placed in a house facing the north, where it may have free access of air of the coolest kind.

Murrain.—It resembles leprosy in its symptoms, with the addition of staggering, shortness of breath, discharge of viscid matter from the eyes and mouth. The treatment should consist of cleanliness, coolness, bleeding, purging, and limitation of food. Cloves of garlic have been recommended to be administered in cases of murrain. Garlic is an antiseptic; and, as in all those ferbile diseases, there exists a more or less degree

of disposition to putrefaction, it is not improbable that it may be found useful.

Measles.—This is one of the most common diseases to which pigs are liable. The symptoms are redness of the eyes, foulness of the skin, depression of spirits, decline or total departure of the appetite, small pustules about the throat, and red and purple eruptions on the skin. These last are more plainly visible after death, when they impart a peculiar appearance to the grain of the meat, with fading of its color, and distention of the fibre, so as to give an appearance similar to that which might be produced by puncturing the flesh.

TREATMENT.—Suffer the animal to fast, in the first instance, for twenty-four hours, and then administer a warm drink, containing a drachm of carbonate of soda and an ounce of bole armenian; wash the animal, cleanse the sty, and change the bedding; give at every feeding, say thrice a day, thirty grains of flour of sulphur, and ten of nitre. It is to dirt, combined with a common fault, too little thought of, viz., giving the steamed food or wash to the pigs at too high a temperature, that this disease is generally to be attributed. It is a troublesome malady to eradicate, but usually yields to such treatment as described, and is rarely fatal.

Jaundice.—SYMPTOMS.—Yellowness of the conjunctive, or "white of the eye," a similar hue extending to the lips, with sometimes, but not invariably, swelling of the under part of the jaw. Bleed behind the ear, diminish the quantity of food, and give a smart aperient every second day. Aloes are, perhaps, the best, combined with colocynth; the dose will vary with the size of the animal. A decoction of woodbine leaves and shoots has been recommended by the French veterinarians.

Foul Skin.—A simple irritability or foulness of skin will usually yield to cleanliness, and a washing with solution of chloride of lime; but, if it has been neglected for any length of time, it assumes a malignant character; scabs and blotches, or red and fiery eruptions appear, and the disease rapidly passes off.

Mange.—If the foul hide, already described, had been properly attended to, and the remedies necessary for its removal applied in sufficient time, this very troublesome disorder would not have supervened. Mange is supposed, by most medical men, to owe its existence to the presence of a minute insect, called "acarus scabiei," or "mange-fly,"—a minute creature which burrows beneath the cuticle, and in its progress through the skin occasions much irritation and annoyance. Others,

again, do not conceive the affection styled mange to be thus produced, but refer it to a diseased state of the blood, which, as is usually the case, eventually conveys its morbid influences to the superficial tissues. Much has been said and still might be said on both sides of the question; but such a discussion is scarcely suitable to the pages of a popular work.

Symptoms.—The symptoms of the disease are sufficiently well known. They consist of scabs, blotches, and sometimes multitudes of minute pustules, on different parts of the body. If neglected, these symptoms will become aggravated; the disease will rapidly spread over the entire surface of the skin; and, if suffered to proceed upon its course unchecked, it will, ere long, produce deep-seated ulcers and malignant sores, until the whole carcass of the poor affected animal becomes one mass of corruption.

The causes of mange have been differently stated; some referring them to too high, and others to too low, a diet. How too low a description of diet can apply to swine it is not easy to conceive—the feeders of that animal never keeping him save for the purpose of making profit of him. Dogs, and other such animals, who are kept only for ornament or pleasure, might, indeed, be starved, or, at all events, placed by their unfeeling masters upon low diet; but most assuredly no swine feeder would commit such an egregious act of folly. The notion, therefore, of mange in swine being caused by under-feeding is not for a single instant to be entertained. No, the cause is to be looked for in dirt, accompanied by hot-feeding. Hot-feeding alone would, perhaps, be more likely to produce measles than mange; but dirt would unquestionably produce the latter disease, even if unaided by the concommitant error of hot-feeding.

Pigs, however well and properly kept, will occasionally become affected with this, as well as with other disorders, from contagion. Few diseases are more easily propagated by contact than mange. The introduction of a single affected pig into your establishment may in one night cause the seizure of scores, and probably furnish you with a three months' hospital experience. Do not, therefore, introduce any foul-skinned pigs into your piggery; in fact, it would be a very safe, and scarcely a very troublesome, process, to wash every new purchase with a strong solution of chloride of lime— a preparation to be had from any druggist or apothecary, if not, indeed, from most country grocers. This substance is very cheap, and a little trouble, when applied as a preventive, is surely preferable to a great deal of trouble and perhaps disappointment, when you are compelled to resort to it as a cure.

Treatment.—If a hog be only afflicted with a mange of

moderate virulence, and not of very long standing, the best mode of treatment to be adopted is—

1. Wash the animal from snout to tail, leaving no portion of the body uncleansed, with soft soap and water.

2. Put him into a dry and clean sty which is so built and situated as to command a constant supply of fresh air, without, at the same time, being exposed to cold or draught. Let him have a bed of clean fresh straw.

3. Reduce his food, both in quality and in quantity. Let boiled or steamed roots, with buttermilk or dairy wash, supply the place of half-fermented brewer's grains, house wash or any other description of feeding calculated to prove of a heating or inflammatory character. It is, of course, scarcely necessary to add that those who have been feeding their swine on horse-flesh, or chandler's greaves, cannot be surprised at the occurrence of the disease. Let them, at all events, desist from that rank and nasty mode of feeding, and turn to such as has been indicated.

4. Let your patient fast for five or six hours, and then give, to a pig of average size, epsom salts, 2 ounces, in a warm bran wash. This quantity is, of course, to be increased or diminished as the size may require it. The above would suffice for a pig of from fifteen to twenty-stone weight (8 lbs. to the stone). It should be previously mixed with a pint of warm water. This should be added to about half a gallon of warm bran wash. It will act as a gentle purgative.

5. Give in every meal afterwards—

Of flour of sulphur, one tablespoonful;
Of nitre, as much as will cover a sixpence,

for from three days to a week, according as you observe the state of the disease. When you observe the scabs begin to heal, the pustules to retreat, and the fiery sores to fade, you may pronounce your patient cured. But before that pleasing result will make its appearance, you will perceive an apparent increase of violence in all the symptoms—the last effort of the expiring malady, as it were, ere it finally yields to your care and skill.

6. There are, however, some very obstinate cases of mange occasionally to be met with, which will not so readily be subdued. When the above mode of treatment has been put in practice for fourteen days without effecting a cure, prepare the following:

1 pint of train oil;
2 drachms of oil of tar;
2 drachms spirits of turpentine;
1 drachm of naphtha,

with flour of sulphur, as much as will form the above into the consistence of a thick paste. Rub the animal, previously

washed, with this mixture, and let no portion of the hide escape you. Keep the pig dry and warm after this application, and suffer it to remain on his skin for three entire days On the fourth day, wash him once more with soft soap, adding a small quantity of soda to the water. Dry the animal well afterwards, and suffer him to remain as he is, having again changed his bedding for a day or so. Continue the sulphur and nitre as before. We have never known any case of mange, however obstinate, that would not, sooner or later, give way before this mode of treatment.

7. Your patient being convalescent, whitewash the sty; fumigate it, by placing a little chloride of lime in a cup, or other vessel, and pouring a little vitriol upon it. In the absence of vitriol, however, boiling water will answer nearly as well.

Finally: Recollect the trouble you have had in curing your patient, and, by proper attention to cleanliness of sty and diet, together with regularity in feeding your stock, take care that you do not have to incur the like on any future occasion. Recollect, also, that all mercurial applications are, as much as possible, to be avoided; but, above everything, avoid the use of ointments composed of hellebore, corrosive sublimate, or tobacco-water; or, in short, any poisonous ingredient whatever. Very few cures have ever been effected by the use of these so-called remedies; but very many deaths have resulted from their adoption.

Staggers.—Caused by excess of blood to the head. Bleed freely from behind the ears, and purge.

Crackings—Will sometimes appear on the skin of a pig, especially about the root of the ears and tail, and at the flanks. These are not at all to be confounded with mange, as they never result from anything but exposure to extremes of temperature, when the suffering animal is not able to avail himself of such protection as, in a state of nature, instinct would have induced him to adopt. They are peculiarly troublesome in the heats of summer, if the hog be exposed to the hot sun for any length of time, without the advantage of a marsh or pool in which to lave his parched limbs and half-scorched carcass. This is an inconvenience sometimes also experienced by the hog's congener, the rhinoceros; and the marshy or fenny swamp is also by him resorted to for relief. This will suffice to inform the reader of the proper means to be adopted in order to prevent the occurrence of cracked ears or skin. Should he desire to afford aid, where neglect has already done its work, let him anoint the cracked parts twice or thrice a day with tar and lard, well melted together.

Ratille, or Swelling of the Spleen.—The symptom most positively indicative of this disease is the circumstance of the affected animal leaning towards one side, cringing, as it were from internal pain, and bending towards the ground. The cause of the obstruction on which the disease depends is overfeeding, or permitting the pig to indulge its appetite to the utmost extent that gluttony may prompt, and the capacity of its stomach admit of. A very short perseverance in this overfeeding will produce this, as well as other maladies, which derive their origin from a depraved condition of the secretions and obstruction of the excretory ducts.

Treatment.—On first perceiving the existence of the complaint, clear out the alimentary canal by means of a strong aperient. If you think you can manage it, you may administer this forcibly, by having the mouth kept open by two cords, that attached to the upper jaw being thrown across a joist, and drawn just so tight as to compel the patient to support himself on the extremities of his fore-toes; but, if you are doubtful of success in the employment of violence,—and, if the pig be a large one, your doubts will be anything but unreasonable,—allow the animal to fast for from four to five hours; he will then take a little sweet wash or broth, and in it you may mingle a dose of epsom salts, proportioned to his bulk. This will generally effect that which is desirable—a copious evacuation; and the action of this medicine on the watery secretions will further relieve the existing diseased state of the spleen.

Many recommend bleeding; and, if the affection have continued for any length of time, it should be resorted to at once. When the disease is, however, discovered ere it has attained any considerable head, the aperient will suffice. The French veterinarians recommend the expressed juice of the leaves and tops of wormwood and liverwort to be given, half a pint for a dose. The decoction of these plants, produced by boiling them in soft water for six hours, is more readily obtained than the expressed juice; and this may be given in doses of from half a pint to a pint and a half, according to the size, age, &c., of the patient.

Scammony and rhubarb, mixed up in a bran mash or with Indian meal, may be given with advantage the following day, or equal portions of blue-pill mass and compound colocynth pill, formed into a bolus with butter, and the animal, having been kept fasting the previous night, will probably swallow it. If he will not do so, let his fast continue for a couple of hours longer, and he will be pretty sure to comply with your wishes. Lower the animal's diet, and keep him on reduced fare, with exercise, and, if you can manage it, grazing until the malady has quite passed away. If you then wish to fatten, remember

to do so gradually. Be cautious of at once restoring the patient to full diet. Indeed my advice to you would be to keep him for a month as a store; and then, when you do put him up to fatten, to feed at regular intervals and always remove whatever food is left from each meal. This is a practice which should never be neglected by pig-feeders; and they will find it not only highly preservative of health, but rapidly conducive to a full state of maturity for killing, and this in a degree which those who have not tried it will scarcely expect.

Surfeit.—Another name for indigestion. The symptoms are such as might be expected—panting, loss of appetite, swelling of the region about the stomach, &c., and frequently throwing up the contents of the stomach. This affection will generally pass away, if only permitted to cure itself, and all food be carefully kept from the patient for a few hours. A small quantity of sweet grains, with a little bran-wash, may then be given, but not nearly as much as the animal would wish to take. For a few days the food had better be limited in quantity, and of a washy, liquid nature. You may then resume the ordinary food, only observing to feed regularly. As already directed, remove the fragments remaining after each meal.

Lethargy.—Symptoms: torpor and desire to sleep, hanging of the head, and frequently redness of the eyes. The apparent origin of the disease is the same as the last, only in this instance acting upon the pig with a natural tendency to a redundancy of blood. Bleed at the back of both the ears as copiously as you can; and, if you cannot obtain a sufficient quantity of blood from these sources, have recourse to the tail. Administer an emetic, of which a decoction of chamomile flowers will be the safest; but, if you have an intelligent apothecary from which to obtain it, he will, on your informing him of the size of your patient, be able to give you a sufficient dose of tartar emetic, and this will be far more certain. After this, as in the former case, reduce for a few days the amount of the animal's food, and administer a small portion of sulphur and nitre in each morning's meal.

Heavings, or Inflammation of the Lungs.—This disease, which has acquired its name from the principal symptom by which it is characterized, is scarcely to be regarded as curable. If, indeed, it was observed in its first stage, when indicated by loss of appetite, and a short, hard cough, it might run some chance of being got under by copious bleeding, and friction with stimulating ointment on the region of the lungs. Minute and frequent doses of tartar emetic should also be given in butter, all food of a stimulating nature carefully avoided, and the animal kept dry and warm. Under these circumstances

there would be no reason absolutely to despair of a cure; but it would be advisable at the same time, if the pig, when this primary stage of the malady was discovered, were not in very poor condition, to put him to death. If once the heavings set in, it may be calculated with confidence that the formation of tubercles in the substance of the lungs has begun, and when these are once formed they are very rarely absorbed. The cause of this disease is damp lodging, foul air, want of ventilation, and unwholesome food.

Treatment.—It is difficult to suggest what should be done when matters have reached this pass, or what remedies would prove of any service. It is now too late, in most cases, to resort to blood letting; and the hide of the hog is so tough that it is not easy to blister it for the purpose of counter-irritation. You may, however, try the following, though perhaps the knife might be best, if only to relieve the poor sufferer, and provide against the danger of infection. It may be as well to state that when once tubercular formation becomes established, the disease may be communicated through the medium of the atmosphere, as the infections influence depends upon the noxious particles respired from the lungs of the diseased animal. Nor is this the only danger to be apprehended. It is yet a question whether this complaint may not be thus communicated to other descriptions of live stock, producing among cattle a disease analogous to, if not identical with, that malignant epizootic which recently committed so much devastation. You may, however, try the following: Shave the hair away from the chest and beneath each foreleg; wet the part with spirits of turpentine, and set fire to it; you will, of course, have had the patient well secured, and his head well raised, and have at hand a flannel cloth, with which to extinguish the flame, when you conceive it has burned a sufficient time to produce slight blisters. If carried too far, a sore would be formed, which would be productive of no good effects, and cause the poor animal unnecessary suffering. Calomel may also be used, with a view to promote the absorption of tubercles; but the success is questionable.

Diarrhœa.—The symptoms, of course, require no comment, as they constitute the disease. Before attempting to stop the discharge—which, if permitted to continue unchecked, would rapidly prostrate the animal's strength, and probably terminate fatally—ascertain the quality of food the animal has recently had. In a majority of instances, you will find this to be the origin of the disease; and, if it has been perceived in its incipient stage, a mere change to a more binding diet, as corn, flour, &c., will suffice for a cure. If you have reason to apprehend that acidity is present, produced, in all probability, by the pig

having fed upon coarse rank grasses in swampy places, give some chalk in the food, or powdered egg-shells, with about half a drachm of powdered rhubarb; the dose, of course, varying with the size of the pig. In the acorn season, and where facilities for obtaining them exist, they will be found quite sufficient to effect a cure. When laboring under this complaint, dry lodging is indispensible; and diligence will be necessary to maintain it, and cleanliness.

Quinsy.—Shave away the hair, and rub with tartar emetic ointment. Steeping with very warm water is also useful. When external suppuration takes place, you may regard it as rather a favorable symptom than otherwise. In this case, wait until the swellings are thoroughly ripe; then, with a sharp knife, make an incision through the entire length, press out the matter, wash with warm water, and afterwards dress the wound with any resinous ointment, which you can obtain from the nearest apothecary. If you cannot obtain anything of the kind, you may form a very tolerable substitute by blending yellow soap with coarse brown sugar. You should, however, never have your house without a good assortment of cattle medicines, distinctly labelled with their names and qualities, and a graduated scale of doses. These can be obtained from any respectable druggist, at a very trifling expense, and may possibly save you the loss of many valuable animals.

Tumors.—These hard swellings make their appearance on different parts of the animal's body. It would not be easy to state the cause which gave rise to these tumors, for they vary with circumstances. They are not formidable, and require only to be suffered to progress until they soften; then make a free incision, and press out the matter. Sulphur and nitre should be given in the food, as the appearance of these swellings, whatever be the cause, indicates the necessity of alterative medicines.

Catarrh.—This is an inflammation of the mucous membranes of the nose, &c., if taken in time, is easily cured by opening medicine, followed up by warm bran-wash, a warm, dry sty, and abstinence from rich grains, or stimulating farinaceous diet. The cause has probably been exposure to drafts of air.

Epilepsy.—This is a disease quite common, and often arises from the ringing of the mother during the period of gestation. It will manifest itself by trembling and staggering of the litter when young, and sometimes show its effects on the grown-up pigs. It is far best to pork the animals at once. If it manifests itself in store animals, full grown, anoint the back bone with turpentine and tallow in equal proportions, melted in

ether; and give half an ounce of sulphur, with a quart of hot spiced ale.

Colic.—This is not an uncommon disease, resulting from too much soured food. It is manifested by great and violent, but intermittent pains; the pig will roll about and kick its belly, then rise up and walk about for a few minutes, and again have a recurrence of the paroxysm. Administer during the interval:

1 gill of peppermint water.
40 drops of tincture of opium.

The animal is to be kept warm, and supplied with food (new milk, warm), until entirely better.

Cholera.—The term "cholera" is employed to designate a disease which has been very fatal among swine in different parts of the United States; and, for the reason, that its symptoms, as well as the indications accompanying its termination, are very nearly allied to what is manifested in the disease of that name which visits man.

Epidemic cholera has, for several years past, committed fearful ravages among the swine of, particularly, Ohio, Indiana, and Kentucky. Indeed, many farmers who, until recently, have been accustomed to raise large numbers of these animals, are, in a great measure, disinclined to invest again in such stock, on account of the severe losses—in some instances to the extent of the entire drove upon particular places.

Various remedies have, of course, been prescribed; but the most have failed in nearly every case where the disease has secured a firm foothold. Preventives are, therefore, the most that can at present be expected; and in this direction something may be done. Although some peculiar change in the atmosphere is, probably, an impelling cause of cholera, its ravages may be somewhat stayed by removing other predisposing associate causes.

Granting that the hog is a filthy animal and fond of rooting among filth, it is by no means necessary to persist, for that reason, in surrounding him with all the nastiness possible; for even a hog, when penned up in a filthy place, in company with a large number of other hogs—particularly when that place is improperly ventilated—is not as healthy as when the animals are kept together in smaller numbers in a clean and well ventilated barn or pen. Look, for a moment, at a drove of hogs coming along the street, the animals all fat and ready for the knife. They have been driven several miles, and are scarcely able to crawl along, many of them having to be carried on drays, while others have died on the road. At last they are driven into a pen, perhaps several inches deep with the manure and filth deposited there by hundreds of predecessors; every hole in the ground has become a puddle; and in such a place

some one hundred or two hundred animals are piled together, exhausted from the drive which they have had. They lie down in the mud, and in a short time one can see the steam beginning to rise from their bodies in volumes, increasing their already prostrate condition by the consequent inhalation of the noxious gas thus thrown off from the system; the blood becomes impregnated with poison; the various functions of the body are thereby impared; and disease will inevitably be developed in one form or another. Should the disease, known as hog cholera, prevail in the neighborhood, the chances are greatly in favor of their being attacked by it, and consequently perishing.

Symptoms.—The symptoms of cholera are as follows: The animal appears to be instantaneously deprived of energy; loss of appetite; lying down by himself; occasionally moving about slowly, as though experiencing some slight uneasiness internally; the eyes have a very dull and sunken appearance, which increases with the disease; the evacuations are almost continuous, of a dark color, having a fetid odor, and containing a large quantity of bile; the extremities are cold, and soreness is evinced when the abdomen is pressed; the pulse is quickened, and sometimes hardly perceptible, while the buccal membrane—that belong the cheek—presents a slight purple hue; the tongue has a furred appearance. The evacuations continue fluid until the animal expires, which may be in twelve hours from the first attack, or the disease may run on for several days.

In a very short time after death, the abdomen becomes of a dark purple color, and upon examination, the stomach is found to contain but a little fluid; the intestines are almost entirely empty, retaining a slight quantity of the dark colored matter before mentioned; the mucous membrane of the alimentary canal exhibits considerable inflammation, which sometimes appears only in patches, while the other parts are filled with dark venous blood—indicating a breaking up of the capilliary vessels in such places.

Treatment.—As a preventive, the following will be found valuable: Flour of sulphur, six pounds; animal charcoal, one pound; sulphate of iron, six ounces; cinchona pulverized, one pound. Mix well together in a large mortar; afterwards give a tablespoonful to each animal, mixed with a few potato-peelings and corn meal, three times a day. Continue this for one week, keeping the animal at the same time in a clean, dry place, and not allowing too many together.

Rabies.—This is one of those afflictive maladies which is, perhaps, developed in the greatest possible degree in the pig. All hope of recovery should be at once abandoned, and the pig at once slaughtered by shooting, and buried whole.

Lice.—These are sometimes troublesome in store pigs. Let them be well washed with soft soap and water; or, if this fails, with a decoction of tobacco.

We have now given a summary of all the principal diseases to which swine are, even under the worst of circumstances, liable; and have certainly omitted none that it would be possible for any but a skillful veterinary surgeon, personally examining the patient, to treat with any hope of success. The instructions which have been given comprise all that the amateur could comprehend, as much as he will ever find necessary for domestic practice, and far more than he will ever find occasion to follow, if he have attended to what has been so frequently insisted upon—cleanliness, dry lodgings, regularity of feeding, the use of salt in the food, and the addition of occasionally a small quantity of sulphur and nitre to the morning's meal. Attention to these precautions will never fail to preserve your stock in health, and thus obviate the necessity of resorting to the use of physic. By thus consenting to take a very trifling amount of trouble, you will save yourself a vast deal of it; nay, you will not only save yourself trouble, but money, anxiety, and disappointment—and all by merely bearing in mind, and adopting in your practice, the old adage—"Prevention is better than cure."

POULTRY.

Choice varieties of fowls add a pleasant feature to the farm premises. They engage the attention and sympathy of the juvenile farmers, and the time bestowed to the poultry yard keeps them from mischief, is an agreeable and salutary relief for toil and study, and elicits the taste, the judgment, and the kindlier feelings of humanity, which are to be matured in the future accomplished breeder. When properly managed, poultry are a source of considerable profit, yielding more for the food they consume than any other stock, although their value is not often considered. The agricultural statistics of the United States, for 1839—forty-four years ago—gave its value at over $12,000,000, and the current value of the poultry in the United States is now probably thirty millions of dollars, and its annual product in eggs and flesh is much greater. It is estimated by McQueen that the poultry of England exceeds $40,000,000, and yet McCulloch says she imports 60,000,000 eggs annually from France (McQueen states it at near 70,000,000), and from other parts of the continent, 25,000,000; besides 80,000,000 imported from Ireland. The people of the United States are much larger egg and poultry consumers than the English, and thus they are a considerable object of agricultural attention, and assume an important place among the other staples of the farmer. The following are the principal breeds:

The Bantam.—The original of the Bantam is the Bankiva fowl. The small white, and also the colored Bantams, whose legs are heavily feathered, are sufficiently well-known to render a particular description unnecessary. Bantam-fanciers generally prefer those which have clean, bright legs, without any

vestige of feathers. A thoroughbred cock, in their judgment, should have a rose comb; a well feathered tail, but without the sickle feathers; a proud, lively carriage; and ought not to exceed a pound in weight. The nankeen-colored and the black are general favorites.

These little creatures exhibit some peculiar habits and traits of disposition. Amongst others, the cocks are so fond of sucking the eggs laid by the hen that they will often drive her from the nest in order to obtain them; they have even been known to attack her, tear open the ovarium, and devour its shell-less contents. To prevent this, first a hard-boiled, and then a marble egg, may be given them to fight with, taking care, at the same time, to prevent their access either to the hen or to any real eggs. Another strange propensity is a passion for sucking each other's blood, which is chiefly exhibited when they are moulting, when they have been known to peck each other naked, by pulling out the new feathers as they appear, and squeezing with their beaks the blood from the bulbs at the base. These fowls being subject to a great heat of the skin, its surface occasionally becomes hard and tightened; in which cases the hard roots of the feathers are drawn into a position more nearly at right-angles with the body than at ordinary times, and the skin and superficial muscles are thus subjected to an unusual degree of painful irritation. The disagreeable habit is, therefore, simply a provision of nature for their relief, which may be successfully accomplished by washing with warm water, and the subsequent application of pomatum to the skin.

The Bolton Gray.—These fowls—called, also, Dutch Every-day Layers, Pencilled Dutch fowl, Chittaprats, and, in Pennsylvania, Creole fowl—were originally imported from Holland to Bolton, a town in Lancashire, England, whence they were named.

They are small sized, short in the leg and plump in the make; color of the genuine kind, invariably pure white in the whole cappel of the neck; the body white, thickly spotted with black, sometimes running into a grizzle, with one or more black bars at the extremity of the tail. A good cock of this breed may weigh from four to four and a half pounds; and a hen from three to three and a half pounds.

The superiority of a hen of this breed does not consist so much in rapid as in continued laying. She may not produce as many eggs in a month as some other kinds, but she will, it is claimed, lay more months in the year than, probably, any other variety. They are said to be very hardy; but their eggs, in the judgment of some, are rather watery and innutritious.

The Cochin China.—The Cochin China fowl are said to have been presented to Queen Victoria from the East Indies. In order to promote their propagation, her majesty made presents of them occasionally to such persons as she supposed likely to appreciate them. They differ very little in their qualities, habits and general appearance from the Shanghaes, to which they are undoubtedly nearly related. The egg is nearly the same size, shape, and color; both have an equal development of comb and wattles—the Cochins slightly differing from the Shanghaes, chiefly in being somewhat fuller and deeper in the breast, not quite so deep in the quarter, and being usually smooth-legged, while the Shanghaes, generally, are more or less heavily feathered. The plumage is much the same in both cases; and the crow in both is equally sonorous and prolonged, differing considerably from that of the Great Malay.

The cock has a large, upright, single, deeply-indented comb, very much resembling that of the Black Spanish, and, when in condition, of quite as brilliant a scarlet; like him, also, he has sometimes a very large white ear-hole on each cheek, which, if not an indispensible or even a required qualification, is, however, to be preferred, for beauty at least. The wattles are large, wide, and pendent. The legs are of a pale flesh-color; some specimens have them yellow, which is objectionable. The feathers on the breast and sides are of a bright chestnut-brown; large and well-defined, giving a scaly or imbricated appearance to those parts. The hackle of the neck is of a light yellowish brown; the lower feathers being tipped with dark brown, so as to give a spotted appearance to the neck. The tail-feathers are black, and darkly iridescent; back, scarlet-orange; back-hackle, yellow-orange. It is, in short, altogether a flame-colored bird. Both sexes are lower in the leg than either the Black Spanish or the Malay.

The hen approaches in her build more nearly to the Dorking than to any other breed, except that the tail is very small and proportionately depressed; it is smaller and more horizontal than in any other fowl. Her comb is of moderate size, almost small; she has, also, a small, white ear-hole. Her coloring is flat, being composed of various shades of very light brown, with light yellow on the neck. Her appearance is quiet, and only attracts attention by its extreme neatness, cleanliness and compactness.

The eggs average about two ounces each. They are smooth, of an oval shape, equally rounded at both ends, and of a rich buff color, nearly resembling those of the Silver Pheasant. The newly-hatched chickens appear very large in proportion to the size of the egg. They have light, flesh-colored bills, feet, and legs, and are thickly covered with down, of the hue commonly called "carroty." They are not less thrifty than any other chickens, and feather somewhat more uniformly than either the Black Spanish or the Malay. It is, however, most desirable to hatch these—as other large-growing varieties—as early in the spring as possible; even so soon as the end of February. A peculiarity in the cockerels is that they do not show even the rudiments of their tail-feathers till they are nearly full-grown. They increase so rapidly in other directions that there is no material to spare for the production of these decora.ive appendages.

The merits of this breed are such that it may safely be recommended to people residing in the country. For the inhabitants of towns it is less desirable, as the light tone of its plumage would show every mark of dirt and defilement; and the readiness with which they sit would be an inconvenience, rather than otherwise, in families with whom perpetual layers are most in requisition. Expense apart, they are equal or superior to any other fowl for the table; their flesh is delicate, white, tender, and well-flavored.

The Cuckoo.—The fowl so termed in Norfolk, England is, very probably, an old and distinct variety; although they are generally regarded as mere barn-door fowls—that is, the merely accidental result of promiscuous crossing.

The name probably originated from its barred plumage,

which resembles that on the breast of the Cuckoo. The prevailing color is a slaty blue, undulated, and softly shaded with white all over the body, forming bands of various widths. The comb is very small; irides, bright orange; feet and legs, light flesh color. The hens are of good size; the cocks are large, approaching the heaviest breeds in weight. The chickens, at two or three months old, exhibit the barred plumage even more perfectly than the full-grown birds. The eggs average about two ounces each, are white, and of porcelain smoothness. The newly-hatched chickens are gray, much resembling those of the Silver Polands, except in the color of the feet and legs.

This breed supplies an unfailing troop of good layers, good sitters, good mothers and good feeders; and is well worth promotion in the poultry-yard.

The Dominique.—This seems to be a tolerably distinct and permanent variety, about the size of the common dunghill fowl. Their combs are generally double—or rose, as it is sometimes called—and the wattles small. Their plumage presents, all over, a sort of greenish appearance, from a peculiar arrangement of blue and white feathers, which is the chief characteristic of the variety; although, in some specimens, the plumage is invariably gray in both cock and hen. They are very hardy, healthy, excellent layers, and capital incubators. No fowl have better stood the tests of mixing without deteriorating than the pure Dominique.

Their name is taken from the island of Dominica, from which they are reported to have been imported. Take all in all, they are one of the very best breeds of fowl which we have; and, although they do not come in to laying so young as the Spanish, they are far better sitters and nurses.

The Dorking.—This has been termed the Capon Fowl of England. It forms the chief supply for the London market, and is distinguished by a white or flesh-colored smooth leg, armed with five, instead of four toes, on each foot. Its flesh is extremely delicate, especially after caponization; and it has the advantage over some other fowls of feeding rapidly, and growing to a very respectable size when properly managed.

For those who wish to stock their poultry yards with fowls

of the most desirable shape and size, clothed in rich and varigated plumage, and, not expecting perfection, are willing to overlook one or two other points, the Speckled Dorkings—so called from the town of Surrey, England, which brought them into modern repute—should be selected. The hens, in addition to the gay colors, have a large, vertically flat comb, which, when they are in high health, adds very much to their brilliant appearance, particularly if seen in bright sunshine. The cocks are magnificent. The most gorgeous hues are lavished upon them, which their great size and peculiarly square-built form display to the greatest advantage. Their legs are short; their breast broad; there is but a small proportion of offal; and the good, profitable flesh is abundant. The cocks may be brought to considerable weight, and the flavor and appearance of their meat are inferior to none. The eggs are produced in reasonable abundance; and, though not equal in size to those of Spanish hens, may fairly be called large.

They are not everlasting layers, but at due or convenient intervals manifest the desire of sitting. In this respect, they are steady and good mothers when the little ones appear.

With all these merits, however, they are not found to be a profitable breed, if kept thoroughbred and unmixed. Their powers seem to fail at an early age. They are also apt to pine away and die just at the point of reaching maturity. They appear at a certain epoch to be seized with consumption—in the Speckled Dorkings, the lungs seem to be the seat of the disease. The White Dorkings are, however, hardy and active birds, and are not subject to consumption or any other disease.

As mothers, an objection to the Dorkings is that they are too heavy and clumsy to rear the chickens of any smaller and more delicate bird than themselves.

In spite of these drawbacks the Dorkings are still in high favor; but a cross is found to be more profitable than the true breed. A glossy, energetic game-cock, with Dorking hens, produces chickens in size and beauty little inferior to their maternal parentage, and much more robust. The supernumerary toe on each foot almost always disappears with the first cross; but it is a point which can very well be spared without much disadvantage. In other respects the appearance of the

newly hatched chickens is scarcely altered. The eggs of the Dorkings are large, pure white, very much rounded, and nearly equal in size at each end. The chickens are brownish-yellow, with a broad stripe down the middle of the back, and a narrow one on each side; feet and legs yellow.

The Black Dorking.—The bodies of this variety are of a large size, with the usual proportions of the race, and of a jet black color. The neck-feathers of some of the cocks are tinged with a bright gold color, and those of some of the hens bear a silvery complexion. Their combs are usually double, and very short, though sometimes cupped, rose, or single, with wattles small; and they are usually very red about the head. Their tails are rather shorter and broader than most of the race, and they feather rather slowly. Their legs are short and black, with five toes on each foot, the bottom of which is sometimes yellow. The two back toes are very distinct, starting from the foot seperately; and there is frequently a part of an extra toe between the two.

This breed commence laying when very young, and are very thrifty layers during winter. Their eggs are of a large size, and hatch well; they are perfectly hardy, as their color indicates, and for the product are considered among the most valuable of the Dorking breed.

The Game Fowl.—It is probable that these fowl, like other choice varieties, are natives of India. It is certain that in that country an original race of some fowl exists, at the present day, bearing in full perfection all the peculiar characteristics of the species. In India, as is well known, the natives are infected with a passion for cock-fighting. These fowls are carefully bred for this barbarous amusement, and the finest birds become articles of great value.

The game fowl is one of the most gracefully formed and beautifully colored of any of our domestic breeds of poultry; and in its form, aspect, and that extraordinary courage which characterizes its natural disposition, exhibits all that either the naturalist or the sportsman would at once recognize as the purest type of high blood, embodying, in short, all the most indubitable characteristics of gallinaceous aristocracy.

The flesh is beautifully white, as well as tender and delicate.

The hens are excellent layers, and, although the eggs are under the average size, they are not to be surpassed in excellence of flavor. Such being the character of this variety of fowl, it would doubtless be much more extensively cultivated than it is, were it not for the difficulty attending the rearing of the young; their pugnacity being such that a brood is scarcely feathered before at least one-half are killed or blinded by fighting.

With proper care, however, most of the difficulties to be apprehended may be avoided. It is exceedingly desirable to perpetuate the race, for uses the most important and valuable. As a cross with other breeds, they are invaluable in improving the flavor of the flesh, which is an invariable consequence. The plumage of all fowl related to them is increased in brilliancy; and they are, moreover, very prolific, and eggs are always enriched.

The Wild Indian Game.—This variety was originally imported into this country from Calcutta. The hen has a long neck, like a wild goose; neither comb nor wattles; of a dark, glossy green color; very short or fan tail; lofty in carriage, trim built, and wild in general appearance; legs very large and long, spotted with blue; ordinary weight from four and a half to six pounds. As a layer, she is equal to any other fowls of the game variety.

The cock stands as high as a large turkey, and weighs nine pounds and upward; the plumage is of a reddish cast, interspersed with spots of glossy green; comb very small; no wattles; and bill unlike any other foul, except the hen.

The Spanish Game.—This variety is called the English fowl by some writers. It is more slender in the body, the neck, the bill, and the legs, than the other varieties, and the colors, particularly of the cock, are very bright and showy. The flesh is white, tender and delicate, and on this account marketable; the eggs are small and extremely delicate. The plumage is very beautiful—a clear, dark red, very bright, extending from the back to the extremities, while the breast is beautifully black. The upper convex side of the wing is equally red and black, and the whole of the tail-feathers white. The beak and legs are black; the eyes resemble jet beads, very full

and brilliant; and the whole contour of the head gives a most ferocious expression.

The Spangled Hamburgh.—The Spangled Hamburgh fowl are divided into two varieties, the distinctive characteristics being slight, almost dependent upon color; these varieties are termed the Gold and Silver Spangled.

The Golden Spangled is one of no ordinary beauty; it is well and very neatly made, has a good body, and no very great offal. On the crest, immediately above the beak, are two small, fleshy horns, resembling, to some extent, an abortive comb. Above the crest, and occupying the place of a comb, is a very large brown or yellow tuft, the feathers composing it darkening toward their extremities. Under the insertion of the lower mandible—or that portion of the neck corresponding to the chin in man—is a full, dark-colored tuft, somewhat resembling a beard. The wattles are very small; the comb, as in other high crested fowls, is very diminutive; the skin and flesh white. The hackles on the neck are of a brilliant orange, or golden yellow; and the general ground color of the body is of the same hue, but somewhat darker. The thighs are of a dark brown or blackish shade, and the legs and feet are of a bluish gray.

In the Silver Spangled variety, the only perceptible difference is that the ground color is a silvery white. The extremity and a portion of the extreme margin of each feather are black, presenting, when in a state of rest, the appearance of regular semicircular marks, or spangles — and hence the name, "Spangled Hamburgh;" the varieties being termed gold or silver, according to the prevailing color being bright yellow or silvery white.

The eggs are of moderate size, but abundant; chickens easily reared. In mere excellence of flesh and as layers, they are inferior to the Dorking or Spanish. They weigh from four and a half to five and a half pounds for the male, and three and a half for the female. The former stands some twenty inches in height, and the latter about eighteen inches.

The Malay.—This majestic bird is found on the peninsula from which it derives its name, and, in the opinion of many, forms a connecting link between the wild and domesticated

races of fowls. Something very like them is, indeed, still to be found in the East. This native Indian bird—the Gigantic Cock, the Kulm Cock of Europeans—often stands considerably more than two feet from the crown of the head to the ground. The comb extends backward in a line with the eyes; it is thick, a little elevated, rounded upon the top, and has almost the appearance of having been cut off. The wattles of the under mandible are comparatively small, and the throat is bare. Pale, golden-reddish hackles ornament the head, neck, and upper part of the back, and some of these spring before the bare part of the throat. The middle of the back and smaller wing-coverts are deep chestnut, the webs of the feathers disunited; pale reddish-yellow, long, drooping hackles cover the rump and base of the tail, which last is very ample, and entirely of a glossy green, of which color are the wing-coverts; the secondaries and quills are pale reddish-yellow on the outer webs. All the under parts are deep glossy blackish-green, with high reflections; the deep chestnut of the base of the feathers appears occasionally, and gives a mottled and interrupted appearance to those parts.

The weight of the Malay in general, exceeds that of the Cochin-China; the male weighing, when full-grown, from eleven to twelve, and even thirteen pounds, and the female from eight to ten pounds; height, from twenty-six to twenty-eight inches. They present no striking uniformity of plumage, being of all shades, from black to white; the more common color of the female is a light reddish-yellow, with sometimes a faint tinge of dunnish-blue, especially in the tail.

The cock is frequently of a yellowish-red color, with black intermingled in the breast, thighs and tail. He has a small, but thick comb, generally inclined to one side; he should be snake-headed, and free from the slightest trace of top-knot; the wattles should be extremely small, even in an old bird; the legs are not feathered, as in the case of the Shanghaes, but, like them and the Cochin-Chinas, his tail is small compared with his size. In the female there is scarcely any show of comb or wattles. Their legs are long and stout; their flesh is very well flavored, when they have been properly fattened; and their eggs are so large and rich that two of them are equal to three of those of our ordinary fowls.

The Malay cock, in his perfection, is a remarkable courageous and strong bird. His beak is very thick, and he is a formidable antagonist when offended. His crow is loud, harsh and prolonged, as in the case of the Cochin-China, but broken off abruptly at the termination; this is quite characteristic of the bird.

The chickens are at first very strong, with yellow legs, and are thickly covered with light brown down; but, by the time they are one-third grown, the increase of their bodies has so far outstripped that of their feathers, that they are half naked about their back and shoulders, and extremely susceptible of cold and wet. The great secret of rearing them is to have them hatched very early indeed, so that they may have safely passed through this period of unclothed adolescence during the dry and sunny part of May and June, and reached nearly their full stature before the midsummer rains descend.

The Plymouth Rock.—This name has been given to a very good breed of fowls, produced by crossing a China cock with a hen, a cross between the fawn-colored Dorking, the Great Malay, and the Wild Indian.

At a little over a year old, the cocks stand from thirty-two to thirty-five inches high, and weigh about ten pounds; and the pullets from six and a half to seven pounds each. The latter commence laying when five months old, and prove themselves very superior layers. Their eggs are of a medium size, rich, and reddish-yellow in color. Their plumage is rich and variegated; the cocks usually red and speckled, and the pullets darkish brown. The have very fine flesh, and are fit for the table at an early age. The legs are very large, and usually blue or green, but occasionally yellow or white, generally having five toes upon each foot. Some have their legs feathered, but this is not usual. They have large and single combs and wattles, large cheeks, rather short tails, and small wings in proportion to their bodies.

They are domestic and not so destructive to gardens as smaller fowls. There is the same uniformity in size and general appearance, at the same age of the chickens, as in those of the pure bloods of primary races.

The Poland.—The Poland, or Polish fowl, is quite unknown

in the country which would seem to have suggested the name, which originated from some fancied resemblance between its tufted crest and the square-spreading crown of the feathered caps worn by the Polish soldiers.

The Polish are chiefly suited for keeping in a small way, and in a clean and grassy place. They are certainly not so fit for the farm-yard, as they become blinded and miserable with dirt. Care should be exercised to procure them genuine, since there is no breed of fowls more disfigured by mongrelism than this. They will, without any cross-breeding, occasionally produce white stock that are very pretty, and equally good for laying. If, however, an attempt is made to establish a separate breed of them, they become puny and weak. It is, therefore, better for those who wish for them to depend upon chance; every brood almost of the black produces one white chicken, as strong and as lively as the rest.

These fowls are excellent for the table, the flesh being white, tender and juicy; but they are quite unsuitable for being reared in any numbers, or for general purposes, since they are so capricious in their growth, frequently remaining stationary in this respect for a whole month, getting no larger; and this, too, when they are about a quarter or half grown—the time of their life when they are most liable to disease. As aviary birds, they are unrivalled among fowls. Their plumage often requires a close inspection to appreciate its elaborate beauty; the confinement and fretting seem not uncongenial to their health; and their plumage improves in attractiveness with almost every month.

The great merit, however, of all the Polish fowls is that for three or four years they continue to grow and gain in size, hardiness and beauty—the male birds especially. This fact certainly points out a very wide deviation in constitution from these fowls which attain their full stature and perfect plumage in twelve or fifteen months. The similarity of coloring in the two sexes—almost a specific distinction of Polish and, perhaps, Spanish fowls—also separates them from those breeds, like the Game, in which the cocks and hens are remarkably dissimilar. Their edible qualities are as superior, compared with other fowls, as their outward apparel surpasses in elegance. They

have also the reputation of being everlasting layers, which further fits them for keeping in small enclosures; but, in this respect, individual exceptions are often encountered—as in the case of the Hamburghs—however truly the habit may be ascribed to the race.

There are four known varieties of the Polish fowl, one of which appears to be lost to this country.

The Silver Pheasant.—This variety of fowls is remarkable for great brilliancy of plumage and diversity of colors. On a white ground, which is usually termed silvery, there is an abundance of black spots. The feathers on the upper part of the head are much longer than the rest, and unite together in a tuft. They have a small, double comb, and the wattles are also comparatively small. A remarkable peculiarity of the cock is that there is a spot of blue color on the cheeks, and a range of feathers under the throat, which has the appearance of a collar.

The hen is a smaller bird, with plumage similar to that of the cock, and at a little distance seems to be covered with scales. On the head is a topknot of very large size, which droops over it on every side. The Silver Pheasants are beautiful and showy birds, and chiefly valuable as ornamental appendages to the poultry yard.

The Spanish.—This name is said to be a misnomer, as the breed in question was originally brought by the Spaniards from the West Indies; and, although subsequently propagated in Spain, it has for some time been very difficult to procure good specimens from that country. From Spain, they were taken in considerable numbers into Holland, where they have been carefully bred for many years; and it is from that quarter that our best fowls of this variety come.

The Spanish is a noble race of fowls, possessing many merits; of spirited and animated appearance; of considerable size; excellent for the table, both in whiteness of flesh and skin, and also in flavor; and laying exceedingly large eggs in considerable numbers. Among birds of its own breed it is not deficient in courage; though it yields, without showing much fight, to those which have a dash of game blood in their veins. It is a general favorite in all large cities, for the additional advan-

tage that no soil of smoke or dirt is apparent on its plumage.

The thoroughbred birds should be entirely black, as far as feathers are concerned; and, when in high condition, display a greenish, metallic lustre. The combs of both cock and hen are exceedingly large, of a vivid and most brilliant scarlet; that of the hen droops over upon one side. Their most singular feature is a large, white patch, or ear-hole, on the cheek—in some specimens extending over a great part of the face—of a fleshy substance, similar to the wattle; it is small in the female, but large and very conspicuous in the male. This marked contrast of black, bright red, and white, makes the breed of the Spanish cock as handsome as that of any variety which we have; in the genuine breed the whole form is equally good.

Spanish hens are celebrated as good layers, and produce very large, quite white eggs, of a peculiar shape, being very thick at both ends, and yet tapering off a little at each. They are, by no means, good mothers of families, even when they do sit—which they will not often condescend to do—proving very careless, and frequently trampling half their brood under foot. The inconveniences of this habit are, however, easily obviated by causing the eggs to be hatched by some more motherly hen.

Fowls for Layers.—The layers must be of a breed that affords chickens easily reared, for success in the nursery department is all-important; they must be at the head of the list of prolific layers of fair-sized eggs. None but a non-sitting race will answer, for sitters make fully double the labor during half of the year; and the feathers must be light, because dark ones show badly when chickens are dressed. There is at present no breed that fulfills all these conditions so well as the White Leghorn. It may degenerate in time, as other races of fowls have done, by being bred for fancy instead of utility, but it possesses now more vigor than any other non-sitting breed. In breeding poultry, show and utility do not get on well together in the long run. To fanciers unquestionably belongs the credit of originating improved breeds, but afterwards, in fixing conventional points for the show-room, the stock is often ruined on our hands. To prevent the freezing of their combs and wattles during severe winters, they should be "dubbed" when the birds are two thirds grown. The opera-

tion is not so painful as might appear, and, if shears are used, the blood-vessels are pinched, and but little blood will flow.

The layers are relied upon to produce the principal part of the income, and, as they are chief in point of numbers, the detached stations where they are kept from the main part of the establishment, to which the breeding and sitting departments are merely tributary. Most of the layers must be kept only until the age of from fifteen to twenty months, and then killed for sale, and their places supplied by young pullets. This course is necessary, because the yield of eggs is greatest during the first laying season if the hens are of an early-maturing breed, and are fed high, and stimulated to the utmost, as they must be, to secure the highest profit. For though hens are still vigorous at two years, it will be found that after a course of forcing to their greatest capacity through the first season, they cannot be made to lay profusely during the second. If we choose not to put on the full pressure of diet the first year, but to feed moderately high for two or three years, a fair yield of eggs would be afforded during each. But such a course would not pay so well as to keep pullets only, and maintain a forcing system constantly from the time they commence to lay until they stop, and then market them before they eat up the profits in the idleness of fall and winter. Pullets grow fast during the early part of their lives, and give a return in flesh for what they eat then. After they commence laying, their eggs are prompt dividends, and, besides, their bodies increase in weight until the age of a year or more. Young hens may be killed a fortnight after ceasing to lay, and if they have been skillfully fed, their flesh will prove excellent for the table as compared with fowls that are two or three years old. It is no wonder that there is little liking for the adult fowls the markets ordinarily afford, for they comprise many that are very old and unfit for food. But regular customers will soon approve fowls a year old, which have been supplied with the cleanest food, and brought to just the proper fatness, and delivered freshly killed and neatly dressed, and our experience proves that the families upon the egg route will order all that the establishment has to dispose of. The high-pressure mode of feeding and turning off while yet young, is then the

true policy. The point is, there is a certain consumption of food to enable an animal to keep alive. The ordinary vital operation, aside from laying or increase of size, demand force, obtained through food—which is money—and we should aim to support only such fowls as are all the while giving returns in either growth or eggs. The long period of moulting and recovering from its consequent exhaustion, costs, as does the maintenance of the vital fires during the cold of winter. It is a matter of quick balancing of profits and expenses with animals, which, like fowls, consume the value of their bodies in about six months. If it is urged that the stimulating diet and unnatural prolificness will subject the stock to disease, the reply is that the regimen is not continued more than six or eight months, and in that time evil effects will not ordinarily follow, for the birds are allowed freedom, sun, and air, and special provision is made for daily exercise. As none of the fowls to which this forcing system is applied leave descendants, no evil effects are accumulated and entailed upon the stock. The layers are from the eggs of fowls that have not been subjected to any such pressure, and during the period of their principal growth they have been given a nutritious but not especially stimulating food—like a colt at pasture. When they arrive at the laying age, they are kept like the horse—broken to work, and put to constant and severe labor, and fed as high as he will bear.

Fowls and Sitters.—The sitters are of a breed chosen for persistence and regularity in incubation, fidelity to their chickens, and gentleness of disposition. The Light Brahmas can not be excelled for hatching and rearing. Pure bloods, however, are not used; but to give less awkwardness and greater spread of wings, they are crossed with snow-white barn-yard fowls. The half-bloods resemble the Brahmas the most in form and other characteristics, and are almost uniformly docile. The half-blood Brahmas are extremely valuable for hatching and taking care of chickens. The results of the labors of poultry fanciers in producing two such breeds as the White Leghorns and Light Brahmas are enough to compensate for all the humbug practiced by many members of the guild. The sitters are not kept at detached stations like the layers, for

several reasons. One is, they should all be near together, because of the great amount of attendance necessary in connection with hatching. Then the buildings should be large enough for the keeper to enter, in order to take care of the nests and chickens, but the size of the structure and the risk of jaring eggs will prevent moving. Nor can the system of indirect feeding and no yards be pursued, for the sitters should be fed at the attendant's feet, and tamed so as to submit quietly to the handling they receive while hatching and rearing. Their yards are sufficiently large to admit of exercise, and for the same reason their dry grain is buried in the ground or under straw. In very cold weather they are confined to their houses for warmth, and are given a stimulating diet to promote winter laying, not so much for the value of the eggs as to render it certain that there shall be a considerable number of birds ready to sit in February, and many more in March. The fowls chiefly depended upon for this, consist of the earliest pullets of the previous year, and also the old hens that have been employed much of the time the preceeding summer in hatching two or three broods. The prevention of laying by hatching and rearing, causes birds thus occupied to lay earlier the next season. By a little management there is no difficulty in procuring plenty of offers to sit from February to June. One half the sitting stock are two years old, and of the pullets of the sitting class raised yearly, some are hatched in February and March, and some in the first week of September, the better to secure sitting in various parts of the year. Except in winter, the sitters should not be fed with a view to encourage laying, but the aim should be to keep them on as moderate an allowance as possible, and not have them become poor. Their specific purpose is incubation, and they should be made to do as much of this as possible. By uniting broods, when a hen has hatched one nest full of eggs she may be given another immediately, and, if managed rightly, she will not be injured by sitting a double term. Each hen must hatch two broods per year at least, and some will hatch three. In this way the stock of 500 sitters will produce 10,000 chickens yearly, or an average of 20 apiece.

Management of Breeding Stock.— The proper management

of the breeding stock is a very important part of the scheme, for there must annually be raised a large supply of pullets of the right quality. The profits of the establishment depend largely on the excellence of the fowls, and as they can be multiplied very fast from a chosen few, no pains should be spared to secure the very best as a source from which to stock the whole farm. There is but one way to do this, and that is to keep individual birds in experimental yards in order to test their merits, recording the degree of excellence and the pedigree of the best with as much care as would be given to breeding cows or horses.

We will suppose it is designed to produce a strain of Leghorns that shall excel in prolificness, laying at an early age, and in other requisites. Procure a pullet from A and a cockerel from B, and put them in yard No. 1; purchase from C and D one bird from each, for yard No. 2, and so on, always taking care that no specimens are obtained from any locality where disease has prevailed. The smaller breeding yards are used as experimental yards, and to allow each cock a proper number of mates, two or more half-blood Brahmas pullets (whose eggs can be distinguished by their color) are added. Give each Leghorn a name or number, and enter in a book all details necessary for testing progress in improving the breed, such as weight, the age at which laying commenced, and the yield of eggs during the first year, at the expiration of which banish all but the best hens. The second year set the eggs of the reserved extra fowls, and keep the chickens produced by each pair separate from all others. At the age of five or six months, cull out the most promising pullets and cockerels, and pair them for testing and recording pedigree and prolificness as before. By mating the produce of the original birds from A and B with the produce of those from C and D, finally the four stocks will become blended in one. Proceed in this manner a number of years, and when in the course of time a very extra prolific and vigorous hen has been found, which reached full size and commenced laying early, and whose ancestry have excelled in the same respects for several generations, as shown by the book, then from her eggs cocks are raised from which to breed to replenish the main stock of layers at the itenirant stations.

These cocks are put in the large breeding yards, each with a flock of ten hens, and no further accounts are kept of the prolificness of individuals.

After new stock is introduced to the experimental yards, as must be done yearly, care is taken for a series of years to avoid breeding akin, and as purchases will be made from fanciers, who to fix the conventional points have most likely bred close and impaired strength, crossing will immediately give a decided increase of vigor. Towards the last, however, when sufficient stamina has been gained, and the stations are to be stocked, close breeding is resorted to. This is to increase the yield of eggs.

In the breeding and experimental yards, the fowls must be fed and managed in every respect with the greatest care. Overfattening is to be deprecated above all other things, and may be avoided by burying all the grain to make the birds exercise by scratching. The supply of grain should be moderate ; meat should be given very often in very small quantities, and the allowance of fresh vegetables should be ample. Free range would be very desirable for all the breeders, but, as it is impracticable, scrupulous care must be taken to furnish artificially natural conditions. Though the birds of the laying class in the experimental yards are rated according to their prolificness, yet the test is merely a relative one, for they are not forced to profuse laying by stimulating food.

Food.—The food of hens may consist of different kinds of grain, either broken, ground or cooked; roots, and, especially, boiled potatoes, are nutritious and economical; green herbage, as clover and many of the grains; chickweed, lettuce, cabbage, etc., will supply them with much of their food, if fresh and tender. Though not absolutely essential to them, yet nothing contributes so much to their laying, as unsalted, animal food. This is a natural aliment, as is shown by the avidity with which they pounce on every fly, insect or earth worm which comes within their reach. It would not, of course, pay to supply them with valuable meat, but the blood and offal of the slaughter houses, refuse meat of all kinds, and, especially, the scraps or crackings to be had at the melter's shops, after soaking for a few hours in warm water, is one of the best and most economi-

cal kinds of food. Such, with boiled-meal, is a very fattening food. Grain is at all times best for them when ground and cooked, as they will lay more, fat quicker, and eat much less when it is fed to them in this state; and it may be thus used unground, with the same advantage to the fowls, as if first crushed, as their digestive organs are certain to extract the whole nutriment. All grain is food for them, including millet, rice, the oleaginous seeds, as the sunflower, flax, hemp, etc. It is always better to afford them a variety of grain, where they can procure them at their option, and select as their appetite craves.

They are also fond of milk, and indeed scarcely any edible escapes their notice. They carefully pick up the most of the waste garbage around the premises, and glean much of their subsistence from what would otherwise become offensive, and by their destruction of innumerable insects and worms, they render great assistance to the gardener. Of course their ever busy propensity for scratching is indiscriminately indulged just after the seeds have been planted and while the plants are young, which renders it necessary that they be confined in some close yard for a time; yet this should be as capacious as possible. Their food, if cooked, is better when given to them warm, not hot; and no more fed at a time than they will pick up clean. Besides their food, hens ought to be at all times abundantly supplied with clean water, egg or pounded oyster shells, old mortar, or slaked lime. If not allowed to run at large where they can help themselves, they must also be furnished with gravel to assist their digestion; and a box or bed of ashes, sand and dust, is equally essential to roll in for the purpose of ridding themselves of vermin.

Hen House.—The hen house may be constructed in various ways to suit the wishes of the owner, and, when tastefully built, it is an ornament to the premises. It should be perfectly dry throughout, properly lighted with glass windows in the roof, if possible, and capable of being made tight and warm in winter, yet afford all the ventilation desirable at any season. In this, arrange the nest in boxes on the sides in such a manner as to humor the instinct of the hen for concealment when she resorts to them. When desirable to set the hen, these nests may be so

placed as to shut out the others, yet open into another yard or beyond the enclosure, so that they can take an occasional stroll and help themselves to food, etc. This prevents other hens laying in their nests while sitting, and may be easily managed, by having their boxes hung on the wall of the building, with a movable door made to open on either side at pleasure. Hens will lay without a nest egg, but, when broken up, they ramble off and form new nests, if they are not confined. They will lay if kept from the cock, but it is doubtful if they will thus yield as many eggs. Hens disposed to sit at improper times, should be dismissed from the common yard, so as to be out of reach of the nests, and plentifully fed till weaned from this inclination.

The Chickens.—The chickens require to be kept warm and dry for the first few days after hatching, and they may be fed with hard boiled eggs, crumbs of bread or pudding, and milk or water, and allowed to scratch in the gravel in front of the hen, which should be confined in a coop for the first three or four weeks, after which they may be turned loose, when they will thrive on anything the older ones eat. Many use them for the table when they are but a few weeks old; but they are much less valuable for this purpose till they have attained to near or quite full maturity. The white legs are preferred by some, from the whiteness and apparent delicacy of the meat; but the yellow and dark-legged are good. The color of the feathers does not seem to affect the quality of the flesh or their character for laying. If we consider the principle of the absorption and retention of heat, we should assume the white coat to be the best, as it is coolest in summer when exposed to the sun, and warmest in winter. Yet some of the white breeds are delicate and do not bear rough usage or exposure.

The Turkey.—Unknown to the civilized world till the discovery of this Continent, it was found here both in its wild and domesticated state, and still occupies the whole range of the Western Hemisphere, though the wild turkey disappears as the country becomes settled. The wild is about the size of the domesticated bird. The color of the male is generally of a greenish brown, approaching to black, and of a rich, changeable, metallic lustre. The hen is marked somewhat like the

cock, but with duller hues. Domestication through successive generations has changed the color of their plumage, and produced a variety of colors—black, buff, pure white, or speckled. They give evidence to the comparative recency of their domestication in the instinct which frequently impels the cock to brood and take care of the young. Nothing is more common than for the male bird to supply the place of the hen, when any accident befalls her, and bring up the family of young chicks with an equally instinctive regard for their helplessness and safety. The flesh of this bird, both wild and tame, is exceedingly delicate and palatable; and, though not possessing the high game flavor of some of the smaller wild fowl, and especially of the aquatic, as the canvas-back duck, etc., it exceeds them in its digestibility and healthfulness. The turkey is useful principally for its flesh, as it seldom lays over a nest full of eggs at one clutch, when they brood on these and bring up their young. If full fed, and their first eggs are withdrawn from them, they frequently lay a second time. We have had them lay throughout the summer and into late autumn.

Breeding.—Those intended for breeders should be compact, vigorous, and large, without being long-legged. They should be daily, yet lightly, fed, through the winter, on grain and roots, and some animal food is always acceptable and beneficial to them. They are small-eaters, and without caution will soon get too fat. One vigorous male will suffice for a flock of ten or twelve hens, and a single connection is sufficient for each. They begin to lay on approach of warm weather, laying once a day, or every other day, till they have completed their clutch, which, in the young or indifferently fed, may be ten or twelve, and, in the older ones, sometimes reaches twenty. The hen is sly in secreting its nest, but usually selects a dry, well protected place. She is an inveterate sitter, and carefully hatches most of her eggs. The young may be allowed to remain for twenty-four hours without eating, then fed with hard boiled eggs, made fine, or crumbs of wheat bread. Boiled milk, curds, buttermilk, etc., are food for them. As they get older, oats or barley meal is suitable, but Indian meal, uncooked, is hurtful to them when quite young. They are very tender, and will bear neither cold nor wet, and it is of course necessary

to confine the old one for the first few weeks. When able to shift for themselves, they may wander over the fields at pleasure; and, from their great fondness for insects, they will rid the meadows from innumerable grasshoppers, etc., which often do incalculable damage to the farmer. Early chicken are sufficiently grown to fatten the latter part of autumn or the beginning of winter, which is easily done on any of the grains or boiled roots. The grain is better for cooking. They require a higher roosting place than hens, and are impatient of too close confinement, preferring the ridge of a barn, or a lofty tree, to the circumscribed limits of the ordinary poultry house. When rightly managed and fed, turkeys are subject to few maladies, and even these careful attention will soon remove.

The Peacock and Guinea Hen.—The peacock is undoubtedly the most showy of the feathered race. It is a native of the southern part of Asia, and is still found wild in the islands of Java and Ceylon, and some parts of the interior of Africa. They are an ornament to the farm premises, and are useful in destroying reptiles, insects and garbage, but they are quarrelsome in the poultry yard and destructive in the garden. Their flesh is coarse and dark, and they are worthless as layers. The brilliant silvery green, and their ever-varying colors give place to an entire white in one of the varieties.

The Guinea hen is a native of Africa and the southern part of Asia, where it abounds in its wild state. Most of them are beautifully and uniformly speckled, but occasionally they are white on the breast, like the Pintados of the West India Islands, and some are entirely white. They are unceasingly garrulous, and their excessively pugnacious character renders them uncomfortable inmates with the other poultry. Their flesh, though high colored, is delicate and palatable, but, like the peacock, they are indifferent layers. Both are natives of a warm climate, and the young are tender and rather difficult to rear. Neither of these birds is a general favorite, and we omit further notice of them.

The Goose.—There are many varieties of the goose. Main enumerates twenty-two, most of which are wild; and the tame are again variously subdivided. The common white and gray are the most numerous and profitable. The white Bremen is

much larger, often weighing over twenty pounds net. It is of a beautiful snowy plumage, is domestic, and reared without difficulty, though not as prolific and hardy as the former. The China goose is smaller than the gray, and one of the most beautiful of the family, possessing much of the gracefulness and general appearance of the swan. There are three varieties of these in the United States; the small brown, with black bill and legs; the larger gray, with black bill and reddish legs; and the pure white, with orange bill and legs. It is prolific and tolerably hardy, but has thus far not been a successful rival with the first. The Guinea or African goose is the largest of the species. It is a majestic and graceful bird, and very ornamental to water scenery. Several other varieties are domesticated in the United States. The finest goslings we have ever reared or seen were a cross from the China gander and common gray goose. They are very hardy and easy to raise.

Breeding.—Geese pair frequently at one year old, and rear their young; but with some kinds, especially of the wild, this is deferred till two and sometimes three. They require a warm, dry place for their nests, and when undisturbed they will sit steadily, and if their eggs have not been previously chilled or addled, they will generally hatch them all, if kept on the nest. To insure this, it is sometimes necessary to withdraw the first hatched, to prevent the old ones wandering before all are out. They should be kept in a warm, sheltered place till two or three weeks old, if the weather be cold or unsettled. The best food for the goslings is barley or oats, or Indian meal boiled, and bread. Milk is also good for them. They require green food, and are fond of lettuce, young clover, and fresh, tender grass, and after a few weeks, if they have a free range on this, they will forage for themselves. Geese are not a profitable bird to raise, except in places where they can procure their own subsistence, or at least during the greater part of the year. This they are enabled to do wherever there are extensive commons of unpastured lands, or where there are streams or ponds, lakes or marshes, with shoal, sedgy banks. In these they will live and fatten throughout the year, if unobstructed by ice and snow.

They may be fattened on all kinds of grain and edible roots, but it is more economical to give them their food cooked. The well-fattened gosling affords one of the most savory dishes for the table. Geese live to a great age. They have been known to exceed forty years. When allowed a free range on good food and clean water, they will seldom get diseased. When well fed, they yield nearly a pound of good feathers in a season, at three or four pluckings, and the largest varieties even exceed this. But plucking is a cruel business, and should not be done closely, and only between the months of May and October. Goslings intended for eating should not be plucked at all until fatted and killed.

Ducks—Are more hardy and independent of attention than the goose, and they are generally the most profitable. They are omnivorous, and greedily devour everything which will afford them nourishment, though they seldom forage on the grass. They are peculiarily carnivorous, and devour all kinds of meat, putrid or fresh, and are especially fond of fish and such insects, worms, etc., as they can find imbeded in the mud or elsewhere. They will often distend their crop with young frogs, almost to the ordinary size of their bodies. Their indiscriminate appetites often render them unfit for the table, unless fattened out of the reach of garbage and offensive matters. An English admiral used to resort to well fattened rats for his fresh meat, when at sea, and justified his taste by saying they were more cleanly feeders than ducks, which were general favorites.

The varieties of ducks are almost innumerable. Main describes thirty-one, and some naturalists number many more. The most profitable for domestic use, aside from the common one, are the Black Cayuga, the Aylesbury, and Rouen, all being of much larger size, and richer and more delicate flavor of flesh. They lay profusely in the spring, when well fed, often producing forty or fifty eggs, and sometimes a greater number, if kept from sitting. They are much larger than those of the hen, and equally rich and nourishing, but less delicate. They are careless in their habits, and generally drop their eggs wherever they happen to be through the night, whether in the water, the road, or farm-yard; and, as might be expected from

such prodigality of character, they are indifferent sitters and nurses. The ducklings are better reared by sitting the eggs under a sedate, experienced hen, as the longer time necessary for hatching requires patience in the foster-mother to develop the young chicks. They should be confined for a few days, and away from the water. At first they may be fed with bread, or pudding made from boiled oat barley, or Indian meal; and they soon acquire strength and enterprise enough to shift for themselves, if afterwards supplied with pond or river water. They are fit for the table when fully grown, and well fattened on clean grain. This is more economically accomplished by feeding it cooked. We omit further notice of other varieties, and of the swan, brant, pigeons, etc., as not profitable for general rearing, and only suited to ornamental grounds.

DISEASES AND REMEDIES.

Most of the diseases to which fowls are subject are the results of errors in diet or management, and should have been prevented, or may be removed by a change, and the adoption of a suitable regimen. When an individual is attacked, it should be forthwith removed, to prevent the contamination of the rest of the flock. Nature, who proves a guardian to fowls in health, will nurse them in their weakness, and act as a most efficient physician to the sick; and the aim of all medical treatment should be to follow the indications which Nature holds out, and assist in the effort which she constantly makes for the restoration of health.

Asthma.—This common disease seems to differ sufficiently in its characteristics to warrant a distinction into two species. In one it appears to be caused by an obstruction of the air-cells, by an accumulation of phlegm, which interferes with the exercise of their functions. The fowl labors for breath, in consequence of not being able to take in the usual quantity of air at an inspiration. The capacity of the lungs is thereby diminished, the lining membrane of the windpipe becomes thickened, and its minute branches are more or less affected.

Another variety of asthma is induced by fright, or undue excitement. It is sometimes produced by chasing fowls to catch them, by seizing them suddenly, or by their fighting with each other. In these cases, a blood-vessel is often ruptured, and sometimes one or more of the air-cells. The symptoms are short breathing; opening of the beak often, and for quite a time; heaving and panting of the chest; and, in

case of a rupture of a blood-vessel, a drop of blood appearing on the beak.

TREATMENT.—Confirmed asthma is difficult to cure. For the disease in its incipient state, the fowl should be kept warm, and treated with repeated doses of hippo-powder and sulphur, mixed with butter, with the addition of a small quantity of cayenne pepper.

Costiveness.—The existence of this disorder will become apparent by observing the unsuccessful attempts of the fowl to relieve itself. It frequently results from continued feeding on dry diet, without access to green vegetables. Indeed, without the use of these, or some substitute—such as mashed potatoes—costiveness is certain to ensue. The want of a sufficient supply of good water will also occasion the disease, on account of that peculiar structure of the fowl, which renders them unable to void their urine, except in connection with the fæces of solid food, and through the same channel.

TREATMENT.—Soaked bread, with warm skimmed milk, is a mild remedial agent, and will usually suffice. Boiled carrots or cabbage are more efficient. A meal of earth-worms is sometimes advisable; and hot potatoes, mixed with bacon-fat, are said to be excellent. Castor-oil and burned butter will remove the most obstinate cases; though a clyster of oil, in addition, may sometimes be required in order to effect a cure.

Diarrhœa.—There are times when fowls dung more losely than at others, especially when they have been fed on green or soft food; but this may occur without the presence of disease. Should this state, however, deteriorate into a confirmed and continued laxity, immediate attention is required to guard against fatal effects. The causes of diarrhœa are dampness, undue acidity in the bowels, or the presence of irritating matter there.

SYMPTOMS.—The symptoms are lassitude and emaciation; and, in very severe cases, the voiding of calcareous matter, white, streaked with yellow. This resembles the yolk of a stale egg, and clings to the feathers near the vent. It becomes acrid, from the presence of ammonia, and causes inflammation, which speedily extends throughout the intestines.

TREATMENT.—This, of course, depends upon the cause. If the disease is brought on by a diet of green or soft food, the food must be changed, and water sparingly given; if it arises from undue acidity, chalk mixed with meal is advantageous, but rice-flour boluses are most reliable. Alum water, of moderate strength, is also beneficial. In cases of bloody flux, boiled rice and milk, given warm with a little magnesia, or chalk, may be successfully used.

Fever.—The most decided species of fever to which fowls are subject, occurs at the period of hatching, when the animal heat is often so increased as to be perceptible to the touch. A state of fever may also be observed when they are about to lay. This is, generally, of small consequence, when the birds are otherwise healthy; but it is of moment, if any other disorder is present, since, in such case, the original malady will be aggravated. Fighting also frequently occasions fever which sometimes proves fatal.

SYMPTOMS.—The symptoms are an increased circulation of the blood; excessive heat; and restlessness.

TREATMENT.—Light food and change of air; and, if necessary, aperient medicine, such as castor oil, with a little burned butter.

Indigestion.—Cases of indigestion among fowls are common, and deserve attention according to the causes from which they proceed. A change of food will often produce crop-sickness, as it is called, when the fowl takes but little food, and suddenly loses flesh. Such disease is of little consequence, and shortly disappears. When it requires attention at all, all the symptoms will be removed by giving their diet in a warm state.

Sometimes, however, a fit of indigestion threatens severe consequences, especially if long continued. Every effort should be made to ascertain the cause, and the remedy must be governed by the circumstances of the case.

SYMPTOMS.—The symptoms are heaviness, moping, keeping away from the nest, and want of appetite.

TREATMENT.—Lessen the quantity of food, and oblige the fowl to exercise in an open walk. Give some powdered cayenne and gentian, mixed with the usual food. Iron-rust, mixed with soft food, or diffused in water, is an excellent tonic, and is indicated when there is atrophy, or diminution of the flesh. It may be combined with oats or grain. Milk-warm ale has also a good effect, when added to the diet of diseased fowls.

Lice.—The whole feathered tribe seem to be peculiarly liable to be infested with lice; and there have been instances when fowls have been so covered in this loathsome manner that the natural color of the feathers has been undistinguishable. The presence of virmin is not only annoying to poultry, but materially interferes with their growth, and prevents their fattening. They are, indeed, the greatest drawback to the success and pleasure of the poultry fanciers; and nothing but unremitting vigilance will exterminate them, and keep them exterminated.

TREATMENT.—To attain this, whitewash frequently all the parts adjacent to the roosting-pole, take the poles down and run them slowly through a fire made of wood shavings, dry weeds, or other light waste combustibles. Flour of sulphur, placed in a vessel, and set on fire in a close poultry house, will penetrate every crevice, and effectually exterminate the vermin When a hen comes off with her brood, the old nest should be cleaned out, and a new one placed; and dry tobacco leaves, rubbed to a powder between the hands, and mixed with the hay of the nest, will add much to the health of the poultry.

Flour of sulphur may also be mixed with Indian meal and water, and fed in the proportion of one pound of sulphur to two dozen fowls, in two parcels, two days apart. Almost any kind of grease, or unctuous matter, is also certain death to the vermin of domestic poultry. In the case of very young chickens, it should only be used in a warm, sunny day, when they should be put into a coop with their mother, the coop darkened for an hour or two, and everything made quiet, that they may secure a good rest and nap after the fatigue occasioned by greasing them. They should be handled with great care, and greased thoroughly; the hen, also. After resting, they may be permitted to come out and bask in the sun; and in a few days they will look sprightly enough.

To guard against vermin, however, it should not be forgotten that cleanliness is of vital importance, and there must always be plenty of slacked lime, dry ashes, and sand, easy of access to the fowls, in which they can roll and dust themselves.

Loss of Feathers.—This disease, common to confined fowls, should not be confounded with the natural process of moulting. In this diseased state, no new feathers come to replace the old, but the fowl is left bald and naked; a sort of roughness also appears on the skin; there is a falling off in appetite, as well as moping and inactivity.

TREATMENT.—As this affection is, in all probability, constitutional rather than local, external remedies may not always prove sufficient. Stimulants, however, applied externally, will serve to assist the operation of whatever medicine may be given. Sulphur may be thus applied, mixed with lard. Sulphur and cayenne, in the proportion of one quarter each, mixed with fresh butter, is good to be given internally, and will act as a powerful alterative. The diet should be changed; and cleanliness and fresh air are indispensable.

Pip.—This disorder, known also as the gapes, is the most common ailment of poultry and all domestic birds. It is especially the disease of young fowls, and is most prevalent in the hottest months, being not only troublesome but frequently fatal.

Symptoms.—The common symptoms of this malady are the thickened state of the membrane of the tongue, particularly toward the tip, the breathing is impeded, and the beak is frequently held open, as if the creature were gasping for breath; the beak becomes yellow at its base; and the feathers on the head appear ruffled and disordered; the tongue is very dry; the appetite is not always impaired; but yet the fowl cannot eat, probably on account of the difficulty which the act involves, and sits in a corner, pining in solitude.

Treatment.—Most recommend the immediate removal of the thickened membrane, which can be effected by anointing the part with butter or fresh cream. If necessary, the scab may be pricked with a needle. It will also be found beneficial to use a pill, composed of equal parts of scraped garlic and horse-radish, with as much cayenne pepper as will outweigh a grain of wheat; to be mixed with fresh butter, and given every morning; the fowl to be kept warm.

If the disease is in an advanced state, shown by the chicken's holding up its head and gaping for want of breath, the fowl should be thrown on its back, and while the neck is held straight, the bill should be opened, and a quill inserted into the windpipe, with a little turpentine. This being round, will loosen and destroy a number of small, red worms, some of which will be drawn up by the feather, and others will be coughed up by the chicken. The operation should be repeated the following day, if the gaping continues. If it ceases, the cure is effected.

It is stated, also, that the disease has been entirely prevented by mixing a small quantity of spirits of turpentine with the food of fowls, from five to ten drops to a pint of meal, to be made into a dough. Another specific recommended is to keep iron standing in vinegar, and put a little of the liquid in the food every few days.

Roup.—This disease is caused mainly by cold and moisture, but it is often ascribed to improper feeding and want of cleanliness and exercise. It affects fowls of all ages, and is either acute or chronic; sometimes commencing suddenly, on exposure; at others gradually, as the consequence of neglected colds, or damp weather or lodging. Chronic roup has been known to extend through two years.

Symptoms.—The most prominent symptoms are difficult and noisy breathing and gaping, terminating in a rattling in the throat; the head swells, and is feverish; the eyes are swollen, and the eyelids appear livid; the sight decays, and sometimes total blindness ensues; there are discharges from the nostrils and mouth, at first thin and limpid, afterwards thick,

purulent and fetid. In this stage, which resembles the glanders in horses, the disease becomes infectious. As secondary symptoms, it may be noticed that the appetite fails, except for drink; the crop feels hard; the feathers are staring, ruffled, and without the gloss that appears in health; the fowl mopes by itself, and seems to suffer much pain.

TREATMENT.—The fowls should be kept warm, and have plenty of water and scalded bran, or other light food. When chronic, change of food and air is advisable. The ordinary remedies—such as salt dissolved in water—are inefficacious. A solution of sulphate of zinc, as an eye-water, is a valuable cleansing application. Rue-pills, and a decoction of rue, as a tonic, have been administered with apparent benefit.

The following is recommended: of powdered gentian and Jamaica ginger, each one part; Epsom salts, one and a half parts; and flour of sulphur, one part; to be made up with butter and given every morning.

The following method of treatment is practiced by some of the most successful poulterers in the country: As soon as discovered, if in warm weather, remove the infected fowls to some well-ventilated apartment or yard; if in winter, to some warm place; then give a dessert-spoonful of castor-oil; wash their heads with warm Castile-soap suds, and let them remain till next morning fasting. Scald for them Indian-meal, adding two and a half ounces of Epsom salts for ten hens, or in proportion for a less or larger number; give it warm and repeat the dose in a day or two, if they do not recover.

Perhaps, however, the best mode of dealing with roup and all putrid affections is as follows: Take of finely pulverized fresh-burnt charcoal, and of new yeast, each three parts; of pulverized sulphur, two parts; of flour, one part; of water, a sufficient quantity; mix well, and make into two doses, of the size of a hazel nut, and give one three times a day. Cleanliness is no less necessary than warmth; and it will sometimes be desirable to bathe the eyes and nostrils with warm milk and water, or suds, as convenient.

Wounds and Sores.—Fowls are exposed to wounds from many sources. In their frequent encounters with each other, they often result; the poultry-house is beseiged by enemies at night, and, in spite of all precaution, rats, weasels and other animals will assault the occupants of the roost, or nest, to their damage. These wounds, if neglected, often degenerate into painful and dangerous ulcers.

When such injuries occur, cleanliness is the first step towards a cure. The wound should be cleansed from all foreign matter, washed with tepid milk and water, and excluded as far as possible from the air. The fowl should be removed

from its companions, which, in such cases, seldom or never show any sympathy, but on the contary, are always ready to assault the invalid, and aggravate the injury. Should the wound not heal, but ulcerate, it may be bathed with alum-water. The ointment of creosote is said to be effectual, even when the ulcer exhibits a fungous character, or proud flesh is present. Ulcers may also be kept clean, if dressed with a little lard, or washed with a weak solution of sugar of lead. If they are indolent, they may be touched with blue-stone.

When severe fractures occur to the limbs of fowls, the best course, undoubtedly, to pursue—unless they are very valuable—is to kill them at once, as an act of humanity. When, however, it is deemed worth while to preserve them, splints may be used, when practicable. Great cleanliness must be observed; the diet should be reduced; and every precaution taken against the inflammation, which is sure to supervene. When it is established, cooling lotions—such as warm milk and water—may be applied.

MEDICINAL.

The Management of the Sick-Room.—The arrangements of the sick-room require attention, and demand special notice. They influence very much the result, and may, indeed, where faulty, baffle the efforts of medicine. We would lay down the following brief rules:—

1. Fresh Air.—Secure a full and free change of air without chilling the patient. According to the state of the weather, have the door, or window, or both open. In the summer time the upper part of the window of a sick-room should always be opened; in cold weather, a fire burning acts as suction-pump to draw off the vitiated air of the room, at the same time that it diffuses sufficient warmth. To secure purity of air, as well as the quiet so necessary for a sick-room, no more persons than are required should be in the room. A crowd of people leads to gossiping, and often exciting talk.

2. The temperature of a sick-room should, if possible, be maintained as near to 60° as possible. In the winter season, unless great care is taken, it will easily fall below this. At other times of the year it is more readily overheated.

In some affections of the respiratory organs there is a great advantage in cold weather in keeping the air of the room warm and moist by the steam from the spout of a kettle. If a piece of tin or lead pipe be attached to the spout, the steam can be brought further into the room. This plan has the additional advantage of securing a tolerably even temperature in the room—an important point in the treatment of croup and other inflammatory affections of the chest.

3. Light.—The light should be so adjusted as to be moderate, according to the sensibility of the patient. Some

persons when ill like a dark room. This is more particularly the case when the head is at all affected. In delirium, a darkened chamber has often a very soothing effect. The bed should not be so placed that the strong lights fall upon the face of the patient. During convalescence, the bright and cheerful light of the sun exerts a beneficial restorative influence.

4. Cleanliness.—A well-known proverb expresses the importance of cleanliness; and, if the proverb apply anywhere, it applies still more forcibly in the sick-room. A common error is that in eruptive fevers the clothes should not be changed for fear of exposure of the surface of the body to a chill. Nothing can be more mistaken; the body linen should not only be changed daily, but the bed-linen should also be changed with advantage at least every two or three days, and removed from the room as quickly as possible. The body should also be washed daily. Children suffering from a scarlet fever, measles, or typhoid, derive comfort and benefit from their bodies being sponged all over daily with warm vinegar and water.

Lotions.—These may be applied simply by frequently washing the surface with them. In scarlet fever the sponging with warm vinegar and water allays the irritation and heat of the surface, and promotes the healthy functions of the skin. A more efficient method for an evaporating lotion is to soak one or two layers of soft linen or lint, wet with the lotion, and laying them on the surface, wet them again when they become dry. The drying takes place through the heat of the surface, the more rapidly, the higher the temperature of the part. An evaporating lotion is readily made by a wineglassful of gin or whisky in a pint of cold water.

Sedative Lotions.—When the lotion is intended to act more by its sedative than by its evaporating effects, it will suffice to lay lint or linen soaked in it upon the surface, and cover it with oil silk or guttapercha tissue. Spongio-piline is a convenient medium for the application of sedative or other than evaporative lotions. Care, however, must be taken that it is not put on too wet, or the lotion will drain out and wet the clothing or bedding. A sedative lotion is made by boiling half

a pound of fresh hemlock-leaves, or half a dozen poppy heads, in three pints of water down to a pint and a half.

Ice.—A greater degree of cold is sometimes required to be applied to a small aprt of the surface, as in the case of a rupture or in fever when the headache and heat of the head are extreme. A convenient mode of reducing the temperature of a part by ice is to pound some small and enclose it in a bladder, taking care first to squeeze out the superabundant air, and then tie the neck of the bladder very tightly. The water in the bladder will continue at the temperature of the ice until every particle of it is melted.

Fomentations.—Fomentations are of a very great value in the relief of pain of internal organs and of large joints when inflamed. They are part of the nurse's duties which require promptitude and judgment. If a large joint—a knee, for instance—be inflamed, much benefit is derived from swathing the joint in flannels wrung out of hot water, and wrapping these in dry outer flannels. Fomentations likewise are of great use in inflammation of the chest or of the bowels. The hot, wet flannels should be put on quickly, and changed quickly, about every five minutes, so as to avoid exposure to the cold air. They may be continued half an hour or more if they do not fatigue the patient.

Wet Sheet.—In fevers with great heat of skin, wrapping the whole body in a wet sheet, and then enclosing in a blanket for an hour or more, will sometimes cause the skin to break into a profuse perspiration, reduce the heat of the skin, and moderate the pulse. In some affections of the kidney, attended with dryness of the skin and absence of perspiration, the wet sheet has been known to restore the action of the skin and relieve the kidneys. The wet sheet is, however, so much a part of the hydropathic treatment of disease that it can scarcely be safely or properly used apart from the medical supervision with all the means and appliances of a hydropathic establishment.

Poulticing.—So common a thing as a poultice might seem beneath notice in such a treatise as the present, but some hints may be given thereon to the nurse. Thus, in making a linseed-meal poultice, most persons pour hot water upon the meal. To

make a smooth, firm poultice, however, the reverse should be the plan—viz., to stir the meal into the water. A poultice should not be too heavy, especially if to be applied on the abdomen. It need not be changed oftener than when it gets cold. There are various kinds of poultices—e. g., mustard, yeast, carrot, bran, charcoal, bread.

Bread poultice may be used alone, for most small purposes, such as a boil. It will be the basis also of the charcoal and carrot poultices.

Charcoal, bruised or powdered coarsely, and mixed with bread poultice, is useful for absorbing offensive odors.

Scraped carrot, mixed with bread poultice, is used to stimulate a sluggish and sloughing or mortifying surface.

Yeast, mixed with bread-crumb, forms also a good poultice for sluggish and offensive ulcers.

Mustard poultice, or sinapism, may be made several ways; sometimes equal parts of bread-crumb or flour, and mustard are used, but the best way is to make a tolerably thick paste of mustard and water, spread it on stiff brown paper, and cover with thin muslin. This poultice is stronger, but requires to be kept on the part a less time than the others. When removed, the surface is easily cleansed by a soft towel. A handy way of making a mustard plaster is to soak a slice of bread in water, and sprikle it with flour of mustard. A ready and efficient sinapism is afforded by Rigollot's "mustard leaves."

Blistering Plaster and Liquid.—Blistering a surface with cantharides may be effected in two ways; one, by the application of the ordinary blister plaster, the other by painting with blistering liquid. When the plaster is used it is usual to leave it on the skin of an adult for eight or ten hours; when, if it has raised a blister, this is to be cut, and the fluid having run out, the surface is then to be covered with a piece of fine dry wadding or carded wool. This dressing being left on for two or three days, the skin will be found healed underneath. This plan is simple and less painful than dressing with lard or spermaceti ointment. If desirable to "keep the blister open" —i. e., its surface discharging—it may be dressed with savine ointment spread on lint or linen.

In the cases of young children, the blister plaster should not be allowed to remain longer than two hours, after which period a muslin bagful of warm bread-and-water poultice should be laid on, and the blister will form under that. After the blister has been cut, the surface can either be dressed with continuation of the poultice, or with dry wool. A warm poultice is a most suitable dressing for blisters, when applied for quinsy or other sore throat.

Blistering Liquid.—As this is intended to be swift in its actions, it should be of the strongest kind that can be purchased. After it has been painted on for a few minutes the skin will be seen to turn white; that is a sign that enough has been painted on. In the course of half an hour blisters will begin to form. These can be dressed as above directed. This mode of raising a blister has many advantages over the plastering. It is speedy in its operation, it is cleaner, and it is more manageable for children and persons in a state of delirium. For cases of apoplexy or paralysis, where a speedy impression upon the nervous centres is desirable, the blistering liquid possesses great advantage, as it does also in acute rheumatism, in which affection the pain is often quickly relieved by having a strip of the liquid painted round the limb near to the swollen joint.

Counter-irritation acts by derivation or diversion of a morbid action from one part by setting up another equally or more powerful influence on the nerves of another part. It places in our hands a very powerful means of acting upon diseases of internal organs that are not absolutely close to the part acted upon, as well as when applied near to the seat of the malady. An example of the latter is afforded by the influence of belladonna or aconite on rheumatic or neuralgic pains; of the former, in the beneficial effects produced on the brain by a blister plaster applied to the nape of the neck.

Counter-Irritants and External Stimulants.—The following are the chief agents of this class mentioned:—

Blistering plaster.
Tincture, liniment, and ointment of iodine.
Compound camphor liniment and turpentine liniment.
Soap liniment (opodeldoc).
Nitrate of silver.

Basilicon ointment.
Citrine ointment.
Belladonna liniment.

The Nurse.—It is not always possible to meet with a well trained nurse, even in a large town, while for those who are likely to consult the pages of this book it may be an impossibility to meet with a professional nurse of any kind. The hints here given are therefore addressed to those who may be compelled to be both nurse and doctor, and who in either capacity may be beyond the reach of professional or other aid. Cheerfulness and forgetfulness of self are prime requisites in the character of the women who undertakes the duties of a nurse. Illness makes people selfish, therefore it is the more necessary that there should be unselfishness to cope with this weakness.

A nurse should secure quietness in the sick room, and should permit only cheerful conversation—if possible, not too much of that. In acute affections of the brain this is a point of the highest importance. In hæmoptysis, or "spitting of blood," strict silence must be enjoined upon the patient, who should make use of a pencil for questions or answers. The nurse should carefully avoid the narration of doleful tales of fearful cases she has seen or heard of, as these depress the patient and interfere with recovery.

Directions for the management of the patient, given by those who are responsible for the well-doing of each case should be strictly attended to by the nurse. In all severe cases of illness, such as fevers, inflammations, accidents, etc., a written memorandum should be kept of each time of taking food, wine, medicine, etc., with their precise quantities. Without a check of this kind it is very easy to give too much or two little, or to transgress directions as to time. It need hardly be remarked that sobriety is absolutely indispensable in a nurse. This requisite is at once admitted; but many persons do, through false kindness' their very best to banish temperance from the sick room. They will leave wine and spirit bottles open in the room, and expect that they shall not be touched. Until nurses in general have gained a much higher character than is at present the case, it is safer not to put temptation in the way.

Caution in Use of Stimulants.—Another point in reference to this same subject may be mentioned. When stimulants are advisable for illness, great care must be taken not only that they are judiciously administered as to present quantity, but that they are discontinued with regard to future consequences, when no longer wanted for immediate requirements.

Lying-in Room.—Labor.—We assume for the purposes of the present work that there is no medical attendant at hand. This state of things may and often does occur even in populous towns; it is, therefore, more likely to happen in new and distant places beyond the reach of medical aid. The possession, therefore, of the knowledge what to do on such occasions may be the source of the greatest possible comfort in an emergency, and possibly the means of saving life. Influenced by this conviction, then, we shall endeavor to lay down such simple rules as shall be found applicable by any one who may find him or herself by imperious necessity called upon to act the midwife's part. Happily, in healthy, well-made women, the process of childbirth rarely terminates otherwise than safely.

The principal point during the progress of labor is to keep the patient cheerful, and, as far as may be, divert her attention from the lapse of time. A light, but not starvation, diet should be taken. A first labor is generally far longer in duration than subsequent ones. Indeed, second and third and subsequent labors are often finished in a few minutes by two or three pains. Twenty-four hours is not too long a time for a natural first labor. It is not requisite here to describe all the stages of labor; suffice it to say, that there are certain promonitory symptoms, such as increased irritability of the bladder, a sinking of the weight and bulk of the abdomen, and the occurrence of pains "such as have not been felt before," as they are usually graphically and not incorrectly described. At this period it is as well to administer a dose of castor-oil if the bowels have not acted freely previously.

The "promonitory" pains, which at first are somewhat irregular in their character, become sooner or later changed into more severe and more irregular periodical pains, at intervals varying from five to ten minutes between, and are at some uncertain time followed by a gush of "the waters." These pains,

which occur generally in the back at first, gradually become longer, and are seated more to the front in the abdomen, and are more expulsive in character. Moderate allowance of stimulants should be administered from time to time. A straining effort to expel becomes unavoidable. The woman should then lie on her left side on a bed properly guarded by a piece of waterproof. A pillow placed between the knees will facilitate the passage of the head into the world. The feet should be fixed against the bedpost or footboard, to which, above the feet, a rope or jack-towel has been affixed, so that with each pain of the expulsive sort the patient may be enabled to bear down the more effectively. This towel or rope should not be used before expelling pains set in.

Management of the New-born Infant.—As soon as the child is born, it should be turned with its face upward, so that it shall be insured breathing room. Care must be taken to pass the navel-string over the child's head, if it be twisted round its neck, otherwise it may be strangled thereby. It should then be separated from its mother by first tying and then dividing the navel-string. The first step, the tying, may be done by any strong ligature. Usually half a dozen brown threads are used to tie the cord with, but a piece of twine or tape will do just as well. The cord or navel-string must be tied firmly in two places—first, about two inches from the child, and then two inches further, and then by a sharp pair of scissors divided between the ligatures.

In the preceding remarks it has been assumed that medical attendance is not to be had. If it be expected in a reasonable time, and the child is born before the arrival of the medical man, all that will be required will be to secure its being able to breathe freely. An infant may be left alone for an hour or two under these circumstances without its incurring harm.

When the child has been expelled and separated, firm pressure should be made on the lower part of the abdomen, the hand grasping the large tumor of the emptied womb. Steady pressure being made firmly in a direction downward and backward, the tumor will be felt to decrease in size, and at the same time the after-birth will be expelled. When this has taken place the labor is finished, and the best thing for the

woman is then to let her alone to rest for a couple of hours. She should on no account be suffered to rise up quickly in bed, as by reason of the recent diminution of the contents of the abdomen, she is peculiarly liable to faint on sitting up. If the labor has been long and exhaustive, a moderate stimulant, such as a glass of wine, or of brandy and water, should be given.

At the end of two hours after the labor, the patient's clothes, etc., should be changed, and a broad binder or bandage pinned round the abdomen, not tightly, but only so as to give the feeling of a comfortable degree of support.

Treatment of the Lying-in Woman.—It has been too much the custom to regard a woman after childbirth as an invalid, or to speak of her as a patient, whereas she is the very reverse. She is in the most natural and healthy of all conditions for a woman, but one requiring more than common care to prevent her falling into diseases, to which she is prone from the great strain that has been put upon her constitution for months past, capped with the climax of hours of pain and strong muscular effort. Under the influence of erroneous views, lying-in women have been kept for days together upon gruel, tea, etc. This treatment has, however, of late years given way to a plan more consistent with common sense, and better calculated to restore the nervous energies after the fatigues of perhaps many weary hours of labor, superadded to months of gestation.

Diet.—Light, but nutritious, food should be given. Beef-tea, milk, eggs, etc., may be freely allowed the first day, and meat on the second day, with wine or malt liquor, according to previous usage, and with strict moderation. After months of gestation and hours of suffering, with absolute loss of bulk, the constitution certainly requires restoration rather than depletion or further pulling down. It should be borne in mind, moreover, that a source of weakness is going on for many days afterwards.

By a strange perversity the contradictory practice of nearly absolute starvation was formerly followed too often by that of inordinate stimulation. It was deemed necessary for the due performance of maternal functions that a large quantity of strong beer should be taken daily. The quantities consumed

under this plea would have seemed incredible to persons of moderate habits. The writer has the still heavier charge to lay against the practice—that it has made many women drunkards.

It may be laid down as a rule that healthy women require no larger quantities of stimulants when nursing than at other times. What serves the purpose, of health before childbirth will serve them afterwards. The secretion of milk, instead of being promoted, is retarded by over stimulation. A pint or a pint and a half of malt liquor daily, is ample allowance for any healthy mother. Those who have been water-drinkers before they were mothers, may safely remain so afterwards.

Rest and Nursing.—Next to care in diet, is care as to rest and quietness. There is no need for absolute silence or total darkness in the room. The cheerful conversation of the nearest relatives may be allowed without fear of ill effects. The room should be kept light and airy. Ventilation should be carefully attended to. There is a popular notion—erroneous, like a good many old nurses' fables—that the eyes of lying-in women are especially intolerant of light. Such is not a fact. The reading of light literature is peculiarly grateful and suitable for this time. The recumbent posture must be preserved for at least a week. After that time, if all be going on well, sitting up in an easy-chair may be permitted. Walking about or standing had better not be attempted earlier than ten or twelve days, as the womb has not yet returned to its normal size, and is consequently heavy and prone to lay the foundation of future maladies if left to its own gravity too early.

Suckling.—The period at which milk is secreted varies in almost every case. Some women will have milk in the breast for weeks before the child is born, others will not have it for several days after. In most instances it comes quietly into the breasts on the second or third day. In some there is a slight degree of febrile disturbance attending its appearance. This, however, quickly subsides under a small reduction of diet—the low-diet system is not to be put in force on account of this trifling disturbance. The infant should be put to the breast about every two hours—not less frequently, lest the breast get

painfully distended; not more frequently, lest it disturb the rest of both itself and mother by its much importunity.

Sore Nipples.—The nursing of the first child is often attended with extremely sore nipples, so that it becomes an excruciatingly painful proceeding, calling for all the firmness of a woman and all the strongest feelings of the mother to enable her to persevere. Perseverance, however, is the great remedy for sore nipples.

A host of drugs and many other means have been recommended for the cure of this distressing affection, but we know of none that in our experience we have known really deserving of confidence. The only serviceable means next to, or in aid of, the perseverance we have spoken of, is the use of Wansborrow's metal shields. These being worn in the intervals of suckling, keep the nipples soft and promote the healing of their cracks.

To Give Medicine to an Infant.—Put a portion of the dose in a teaspoon, then, holding the child on the lap in a half-sitting and half-lying posture, place the spoon on the tongue and slide it gently back towards the throat; when it has reached quite to the root of the tongue, tilt it up and hold it still on the tongue until the child swallows. Repeat the rest of the dose in the same way. It is better to give the dose in portions, so that there is less risk of choking by too large a dose.

DISEASES AND REMEDIES.

Ague.—Ague is a periodic fever, occurring in three distinct stages, with an interval of distinct remission, or freedom, from fever—viz., a cold stage, a hot stage, and a sweating stage, occupying about eight hours. The attack recurs with more or less regularity, giving rise to types according to the period of their recurrence. 1. The quotidian, recurring once in twenty-four hours. 2. Tertian, every forty-eight hours. 3. Quartan, every seventy-two hours.

The quotidian ague is the most common form; an interchange, or irregularity of the periods of return, is sometimes seen, giving to it modifications which greatly obscure the type of the disease. The term, "intermittent fever," which is given to ague, is derived from the entire remission which occurs between the paroxysms, leaving the patient apparently in his ordinary health.

SYMPTOMS.—The disease is ushered in, for a few days, by indefinite malaise, such as slight feverishness, and a feeling of fatigue and debility. On these premonitory symptoms there follows somewhat suddenly the cold stage, in which the patient becomes cold, pale, and "goosey," the teeth chatter. Severe headache occurs, the pulse is rapid, and breathing hurried. The cold stage continues for a period varying up to two or three hours, and then gives way to the hot stage, in which the headache becomes more severe; the whole surface of the body is flushed, hot, and dry, the features appear swollen, the eyes bloodshot, the pulse full and strong; thirst is very urgent, appetite lost, the urine scanty and high-colored. The febrile excitement is so great that sometimes delerium occurs in this stage, and may mislead as to the real nature of the fever. The hot stage may last for six hours or upwards, and is then replaced by the sweating stage, in which relief comes by, at first, a moisture appearing on the forehead and face, gradually increasing until it breaks out all over the body as a profuse sweat, followed by a general relief of symptoms, and, with the exception of a feeling of exhaustion, the patient is apparently quite well, until another paroxysm occurs, which it is very prone to do. A degree of sallowness of the complexion, however, usually remains, sometimes even after the entire subsidence of the disease. The preceding set of symptoms constitute an "attack" of intermittent fever, or ague, but their subsidence, unfortunately, is not always the complete restoration of health. The subjects of ague, in marshy districts, may almost always be recognized by their muddy or sallow complexion, indicative of a "cachectic" or impaired state of general health. The extent to which this depreciation of health and vigor may reach depends upon the length of the duration of the fever and the severity of the paroxysms. When these are severe and long-continued, serious congestion and disorders of the internal organs is very prone to follow. The spleen is more especially obnoxious to this congested condition, with consequent enlargement known as "ague cake." The enlarged condition of the organ may even be perceptible to pressure beneath the lower border of the ribs on the left side.

CAUSES.—The cause of ague is usually marsh miasm. It is not absolutely essential that a marsh shall yield the poison, as we occasionally meet with the disease in London and other places, in the presence of malaria arising from the decomposition of dead vegetable matter. It was formerly very common in London, but has disappeared from that city since sanitary regulations have very much cleared away the vegetable refuse which in bygone times disfigured the streets.

TREATMENT.—The treatment of ague resolves itself into

two principal indications, of getting rid of the cause—i. e., the malarious poison in the blood, and diminishing the violence of the paroxysms. The cold stage is that part of the paroxysm which, more particularly in hot climates, most urgently requires aid, and is that from which injurious effects may follow on the congestion of internal organs. As soon as the shivering begins the patient should go to bed, be well covered with blankets, and have hot bottles to the feet, bags of hot bran, salt, etc., together with a free supply of hot drinks. If these means do not succeed in arresting the rigor, an emetic of mustard and hot water will often be effectual to bring on the sweating stage. As this comes on, the quantity of clothing should be gradually decreased, taking care to avoid a sudden chill. The sweating may be promoted if it do not come on too freely; it may be promoted by the administration of stimulants, such as brandy and arrowroot, or wine and egg, etc. After the paroxysm has passed off, an aperient dose is often of service.

In order to ensure the full benefit of medical treatment, a change from the malarious to a purer air is desirable, and should not be omitted where it can be put in practice. The medical treatment in the remission, or the endeavor to eliminate the poison, must be put in practice in the intervals. For this purpose the most valuable remedy is the Peruvian bark, or quinine, the essentially active principle of bark.

In this country it is seldom necessary to give the quinine in so large or so continued doses as in some tropical climates, where it is essential not only as a curative, but also as a preventive means. Two, three, or five grains, taken every morning, has been found of the greatest service in keeping Europeans free, not only from ague, but also from other endemic fevers of the African continent.

In the ordinary treatment of ague in temperate climates it is usual to give two or three grains of quinine three times, or one large dose of five to ten grains given as nearly as possible before the expected access of the paroxysm. This will often anticipate or cut short the paroxysm.

The quinine may be given simply mixed in water, or added to a glass of sherry wine. It is usual, but entirely superflous, to render the sulphate of quinine solvent by the addition of a few drops of diluted sulphuric acid.

Apoplexy.—Symptoms.—The Greek etymology of this word, —viz.: to strike or knock down with violence—expresses the leading symptoms of the attack. In the severest form of the disease, the patient is suddenly struck down, deprived of voluntary motion, sensation, and intellect, it may be, with convulsions of one side of the body, and lies as one in deep sleep from which he cannot be roused, with snoring, puffing breath-

ing, dilated pupils, a flushed face, and full, slow pulse, and, possibly, with vomiting.

In another class of cases, the patient does not, perhaps, fall suddenly to the ground, but turns pale, and feels faint, or experiences an attack of giddiness or headache, with sickness or vomiting, and occasionally with slight convulsive movements, the pupils natural, or but slightly dilated, the pulse weak and irregular. The pain in the head may be attended with loss of memory, loss of power in the limbs, passing into entire apoplexy or paralysis. The symptoms will vary in their intensity, and in their duration—the attack may last for a few minutes only, or be extended over several days, and at last the patient sinks into a state of coma, or profound stupor, from which he never recovers.

TREATMENT.—At the time of the fit the first thing to be done is to loosen all articles of clothing about the neck and chest, so as to favor the return of the blood from the head—to place the patient in a reclining posture, not flat down. If the pulse be feeble or irregular, a small quantity of brandy and water may be given; cautiously, on account of difficulty of swallowing. Mustard plasters, or rags soaked in turpentine, should be applied to the calves of the legs. If the person be of a full habit, and have a strong, slow pulse, a strong purge should be given as soon as possible. One drop of croton oil placed on the tongue, is at once convenient to give and effective in action. Should this fail to act, in two or three hours a clyster of castor oil and turpentine should be administered.

Bleeding in any form is seldom required in these cases, and is never safe in non-professional hands. It is very easy, under circumstances of alarm and excitement, to do too much. The after effects of an apoplectic seizure require very judicious management; and here, again, we would warn the reader against expecting too much from mere medical means, and to be careful not by over-anxiety for stimulation, to accelerate a dangerous reaction. As the insensibility passes off, and the patient wakes up to what is passing around him (supposing that he has been unconscious), great care must be taken to secure quietness and rest. As little conversation as possible should be carried on; the room should be well aired and moderately lighted. Complete rest of body and mind are essential to recovery. As the limbs recover their muscular power, they must be carefully and only gradually brought into use. Caution must also be exercised in the administration of food of a light and nutritious character. The muscles of the throat having probably suffered in the attack, will require time to resume their power, and hence there will be danger of choking if care be not taken. The food must be light and easy of digestion,

since the functions of the stomach will also be impaired, and, if too solid or indigestible food be given, it may cause vomiting and serious disturbance. Should the pulse be feeble, a little brandy or wine may be allowed to be taken with light food. All this precaution is required to guard against inflammation of the brain, which may follow on reaction indicated by increased rapidity of pulse, heat of skin, thirst, and headache.

Should the bowels be costive, some simple saline purgative, such as Epsom salts or Seidlitz powder, should be taken. If there be persistent headache, blistering behind the neck will relieve it. If these means fail to subdue the inflammatory and febrile symptoms, the case must be treated as one of inflammation of the brain. Paralysis, or permanent loss of power on one side of the body, or of some muscles or portion of the surface on one side, is not unfrequently left after an apoplectic attack. (See Paralysis.)

Asthma.—This is sometimes called "Spasmodic Bronchitis," and consists of a sudden attack of tightness across the chest, with difficulty of breathing, of a most urgent and distressing kind—so much so, that in the course of less than an hour immediate suffocation seems to be impending. The patient is fighting and struggling for very life, gasping for air, speech nearly impracticable, the eye protruding, the countenance anxious, flushed, or of a blue discoloration. The skin becomes bedewed with cold clammy sweat, the hands and fingers blue; altogether forming as distressing a scene as can be witnessed, but happily not one that is often fatal, as it passes off generally with a restoration of the bronchial secretion which has been suspended. This favorable occurrence varies in its advent. The paroxysm, however, seldom lasts more than a few hours at the utmost, but the bronchitis which follows lasts sometimes for several days. The attack is liable to return at uncertain periods.

Treatment.—The treatment of this affection is guided by its essentially spasmodic character during the paroxysm. Hot and stimulating fomentations should be applied to the chest, and sedative and nauseant medicines given at short intervals, thus:—

Ipecacuanha wine, 2 drachms; paregoric, 2 drachms; tincture of henbane, 4 drachms. Add water to eight ounces, and give one tablespoonful every hour, until the breathing is easier. Or an emetic of mustard and water may be given previously.

As the paroxysm subsides, give the following: Compound tincture of cardamoms, 1 drachm; chloric ether, 20 minims; fœtid spirits of ammonia, 30 minims; water, a wineglassful; every four hours for some hours and then either treat as for

acute bronchitis, if cough, etc., continue, or withdraw all medicine, and leave nature to complete the cure.

Biliousness, Billiary Derangements, Congestion of the Liver.—These are known under various names, confounding together stomach and liver disorder; thus we have them spoken of as "sick-headache," "bowel complaint," "jaundice," etc.

Symptoms.—They may be classed under the two heads of "diminished secretion," and "excessive secretion." The latter produces English cholera, or diarrhœa, of a troublesome character, attended with griping pains, and more or less sickness, the attack being of an acute character.

A diminution in the secretion of bile generally manifests itself by symptoms of a more chronic type. They are more tardy in their approach, and do not pass off so quickly as those of an excessive flow of bile. This form of deranged functions of the liver is indicated by irregularity in the intestinal functions; the bowels act with sluggishness, and become constipated; the evacuations are pale or slate-colored; the stomach begins to show its participation in the disorder by dyspepsia, flatulence, nausea. A well-known pain under the right shoulder-blade is one of the commonest attendants of this disorder. Headache occurs. The sight is impaired or interrupted by dark specks or films, termed "muscæ volitantes," floating, as it were, before the eyes. The complexion becomes sallow, or of a muddy, yellowish color. The patient becomes a sufferer from piles, and, as an almost inevitable consequence of such varied derangement of functions, depression of spirits follows. This latter is a very common attendant upon disorders of the liver, the word hypochondrical having an etymological reference to the liver as the seat of the disorder. Jaundice is not an unfrequent occurrence to children suffering from bilious derangement, but has not then a serious import. Jaundice is a very frequent occurrence with new-born infants, and arises from an alteration in the course and quantity of blood that passes through the liver after birth. It cannot be called a disease under such circumstances, nor does it require medicinal treatment. In the former condition—that of an excessive flow of bile—the liver is said to be in a state of active congestion; in the latter, of passive congestion. The former may pass into inflammation. This, however, is rarely seen in this country, but is only too frequently met with in hot climates. The pain that is felt in the right side with the above described symptoms, and not uncommonly regarded as an indication of inflammation of the liver, is the result of congestion of the organ. Acute inflammation of the liver is attended with great pain in the right side, extending to the right shoulder-blade,

and tenderness on pressure over the region of the organ, aggravated by lying on the left side. The pain in the region of the liver may be so acute as to make it difficult to distinguish from that of plurisy, while, on the other hand, the mistake is often made of regarding a limited extent of plurisy in the lower part of the chest as an attack of inflammation of the liver. With the pain there is, in inflammation of the liver, a varying degree of fever, thirst, loss of appetite, nausea, vomiting, hiccup. The urine becomes scanty and is high-colored. The bowels are frequently costive, the evacuations very pale, even white, showing a deficiency in the flow of bile. The same defect of flow of bile by the intestines causes its absorption into the circulation, giving rise to yellowness of the complexion and coats of the eye—jaundice. If the inflammation is not subdued, the pain will probably become of a throbbing character, severe shivering will occur, and an abscess form. This may burst into the chest and the matter be expectorated, or it may become the cause of serious mischief in the cavity of the chest, or it may find its way by opening into the stomach and be vomited, or it may escape externally by opening into the surface of the body; which of these shall occur we cannot determine.

In chronic inflammation of the liver the preceding symptoms are present in a milder degree, but are slower in their progress—they are attended with less feverishness. There is present depression of spirits amounting sometimes to melancholy. As the disease progresses, diarrhœa, debility, wasting, and dropsy are pretty sure to make their appearance, followed by death from exhaustion.

Treatment.—Bilious derangement, "congestion of the liver," or jaundice, is prone to occur in overfed children, and produce sickness and diarrhœa, with light-colored, slimy stools. This derangement (English cholera), under judicious dietary, generally corrects itself by carrying off excess of bile or badly-digested food. If, however, it continues more than a day or two in spite of careful dieting and abstinence from stimulative food, a mild mercurial will be of service, such as, (for a child over three years of age):

Gray powder (mercury with chalk), 1 grain; prepared chalk, 3 grains; magnesia, 1 grain. Given night and morning. Or: — Rhubarb powder, 3 grains; ipecacuanha powder, one-fourth grain; nitre powder, 2 grains. Mi and give twice a day.

In biliousness occurring to adults, and attended with sickness, the first thing is to give the stomach as nearly as possible entire rest by putting almost nothing into it while the vomiting lasts. This may moreover be checked sometimes by small pieces of ice taken into the mouth, and swallowed when par-

tially melted. Soda-water in small quantities frequently taken is also serviceable. A mustard plaster on the pit of the stomach assists also in checking sickness. When the sickness has passed off, the greatest care in diet is required. Fish, poultry, boiled mutton, with a moderate allowance of well-cooked green vegetables, such as cauliflower, asparagus, marrows. Light wine, such as claret, may be allowed.

The diarrhœa that occurs in these disorders of the liver may be checked by mineral acids—e. g.,

Diluted muriatic acid, 2 drachms. Compound tincture of cardamoms, 1 ounce.

Cinnamon water, to 8 ounces. Mix, and give an eighth part every three or four hours.

In chronic biliary derangements occurring in "bilious habits," more may be done by abstemious living than by physic. The habit of taking so-called "anti-bilious" pills, calomel, blue pill, etc., to correct disorders of the liver, that may be avoided by avoiding there causes, is simply absurd. But where, in spite of care, the liver is habitually sluggish, an occasional small dose of blue pill at bedtime, followed by a simple aperient in the morning, may safely be taken. In some persons, however careful they may be, the proneness to biliary derangement is greater than can always be managed by even great care in dieting. In such cases the repeated use of small doses of mineral acids, with extract of dandelion or sarsaparilla, is believed to be useful. Fresh air and outdoor exercise are also important means—horse exercise, if possible.

Acute inflammation of the liver is, as already remarked, rarely met with in temperate climates. In parts of India and other hot climates, it is not unfrequently met with, owing partly to the solar heat and partly, it is said, to imprudence in dieting and exposure. An active treatment is required, such as free leeching over the region of the liver, or cupping if there be any skilled person to perform it. At the same time full doses of calomel are to be given (five to ten grains), and repeated every six hours, followed up by saline purgatives, such as Epsom salts and senna. While these are taking effect, mercurial ointment should be rubbed into the armpits and groin night and morning. This would be the treatment for a case of acute inflammation of the liver occurring in a tropical climate, in an adult person. There is, however, some reason to believe that calomel has been somewhat too liberally given in such cases.

Bite of a Venomous Serpent.—Suck the wound immediately, if you can, yourself; if not, get a friend to do so (it can be done without danger, if there be no abrasure—scratch, that is—or sore on the tongue or lips), and then tie a string, if possible, tightly round the part, finger or limb, that has been bitten, be-

tween the wound and the body; wash well with warm water, and apply liquor ammoniæ diluted to the wound, and take fifteen to twenty drops in a wine-glass of water internally, every three or four hours; keep the patient from going to sleep.

Bite from a Dog Suspected to be Mad.—Soak immediately in, and wash with, water as hot as you can bear it; then apply salt to it freely, and send for a doctor to cut out the part, if practicable, or to burn it with lunar caustic, and if you cannot get one, do it yourself, only do not overdo it. If you have no lunar caustic at hand, use a good, strong solution of carbolic acid to the place. Take a Turkish bath at once if possible; it is one more chance in your favor.

In all cases, if possible, send for a medical man, but if one cannot be had, the above remedies are applicable.

N. B.—The wound may be sucked with impunity either by the person himself who is bitten, or by a friend for him, if he has no abrasion, that is, scratch, or sore place, or sore on his mouth, or lips. Do not cauterise the wound yourself, if you can help it; leave that to a medical man, if one can possibly be got within a short time. Sad results have been known to occur from unskillful cauterization.

A bite from a dog not mad gives rise to great inflammation; linseed poultice, sprinkled with from fifteen to twenty drops of laudanum, is the best application for this; it may be continued about a week.

Bleeding at the Nose.—Lay the patient immediately at his full length upon the floor, or on a table, or on a bench, and stretch out his arms behind his head, to their full length, on a level with his body; unloose the collar, and apply wet towels to the back of his neck. I have always found this posture, that is, laying the patient flat on the back, answer best; but many excellent doctors do not consider the posture of the body of importance, and as sitting or reclining back in an arm chair is more convenient and less fussy, it will probably be sufficient to place the arms in a vertical position, that is, straight up above the head. If the bleeding continue obstinate, use ice if you can get it, instead of water, and put a plug of lint in the nostril, steeped in a strong solution of alum and water. If you can get it, snuff up the nose a solution of gallic acid, or, better still, of tannic acid, or even inject it up the nose. It is the most powerful astringent of all. For a child's nose when bleeding, a large, cold door key laid behind the neck and between the shoulders, will often suffice, compressing at the same time the nostril with the finger firmly for a few minutes. When the above treatment fails, snuff up a few drops of tincture of saffron (crocus sativus) in a little water. This is almost sure to answer.

Bladder, Inflammation of.—Symptoms.—This affection is indicated by acute pain of a burning character at the lower part of the stomach, or, more strictly speaking, abdomen, and of the body, and down the thighs. The pain is augmented by pressure, and by passing water, occasion for which is frequent, its voidance difficult, and in small quantities. A considerable degree of fever is present, attended with restlessness, heat of skin, and increased frequency of the pulse. The urine that is passed is turbid, cloudy, and high-colored, and sometimes bloody.

Treatment.—In the treatment of acute inflammation of the bladder the patient must be kept to his bed, and have a dozen leeches applied to the lowest part of the body or just in front of the fundament—the bleeding to be encouraged by hot fomentation and poultices or a hot hip bath. At the same time free purgation should be promoted by epsom salts or Glauber's salts; full doses of opium, either as pill or tincture, should be administered to relieve the pain and urgency to evacuate the bladder. After these measures have been put in force, and have somewhat relieved the suffering, the following mixture may be given:—

Bicarbonate of potash, 15 grains; tincture of henbane, 1 drachm. And repeated every four or six hours, according as the symptoms yield or not.

The diet must be of the mildest and most unstimulating character.

Bleeding from the Lungs, Spitting of Blood, Expectoration of Blood, Hæmoptymis.—Symptoms.—Occurr usually with the presence of cough, and a tickling feeling at the back of the throat, preceded frequently by sense of oppression or of weight in the chest: the blood is expectorated in very varying quantities, generally exciting a well-founded alarm. The blood may be brought up pure, or mixed with the mucus of the air passages. In some instances, the mouth fills with blood, unattended with cough. A saltish taste in the mouth is very often experienced. Its florid color, frothy character, and attendant cough, will assist in its distinction from vomiting of blood.

Treatment.—Bleeding from the lungs is not always attended with the danger that is generally apprehended. Although its occurence excites alarm in reference to the existence of consumptive disease, it is sometimes beneficial rather than otherwise, as it tends to relieve congestion in the weak part of the lung. Very few cases prove fatal from the bleeding alone.

The strictest rest and puiet, and absolute silence, should be

enforced; the chamber be cool and airy, admitting of free ventilation. The patient should be placed half-sitting Only cold drinks, or pieces of ice should be allowed at first. All food should be given cold. Only in case of extreme faintness should stimulants be given.

The medical treatment required, is the administration of astringents internally, e. g.: Gallic acid, 30 grains; epsom salts, one-half ounce; diluted sulphuric acid, 1 drachm; water, to 6 ounces. Mix. Give a sixth part every three hours, unless the medicine purge too freely, then the epsom salts may be omitted.

Cloths dipped in cold water, or spirit and water, should be kept applied on the chest. The rest and quiet should be observed for several days after the hemorrhage has ceased, which it will do, probably, only gradually, the expectoration being streaked for a variable time.

Bleeding from the Stomach and Bowels.—HÆMATEMESIS OR VOMITING OF BLOOD—Is usually a result of some internal disease causing obstruction of the circulation of blood through the liver, spleen, or stomach; or it may be a result of the derangement of more distant organs. Ulceration of the mucous surface of the stomach itself may lead to the opening of a vessel therein. It is preceded by a sense of nausea or sickness, or faintness, and by a feeling of heaviness or of oppression at the pit of the stomach. The blood vomited is generally of a dark color, and is mixed with food, and differs in color from the frothy fluid blood that is coughed up from the air passages.

TREATMENT.—If the bleeding be traced to some derangement or congestion of the liver, it should be treated according to the directions laid down for vomiting in bilious disorders, and the treatment directed for chronic biliary disorders. If it have been preceded by dyspepsia, pain in the pit of the stomach, or other signs of disorder of that organ alone, without much general derangement of the health, it is to be feared that the bleeding may proceed from an ulcer within the stomach perforating a blood-vessel. In this case, ice should be given, and very little else, at the time, except it be some astringent medium—e. g., five or six grains or gallic acid or tannin every four hours, with a drachm of epsom salts, since an aperient may be useful to clear away what blood may have passed into the bowels. In these cases of bleeding from the stomach the curative treatment is dietic. Milk alone should be allowed for a few days. After four or five days, some white of egg may be stirred up in the milk, and this should constitute the sole diet for two or three weeks. At the end of this time, small quantities of whiting, or some other white fish, may be allowed. The longer this diet can be maintained, the more

sure the result. A return to ordinary diet must be very gradual, and by taking carefully of poultry or well-cooked mutton.

Boils and Carbuncles.—SYMPTOMS.—Boils are distinguishable from carbuncles by their smaller size, by their conical shape, inflamed base, and tendency to form matter at the point. Beneath the matter is a portion of dead tissue or "core."

Carbuncle is a large and flattened compound boil, without the tendency to present a conical point. A carbuncle tends to form matter, and opens at various parts of its surface. At these points the skin gives way, presenting a riddled aspect, gradually running into one sore. The inflamed base of a carbuncle extends wider than that of a boil, and has a harder feel, resembling, indeed, the consistence of brawn.

TREATMENT.—A small boil requires no treatment beyond protection from friction, by diachylon or soap plaster. If, however, it be large, inflamed, and painful, water dressing or warm poultices should be applied, until the core has sloughed out. It should then be dressed with zinc ointment. A carbuncle should, in the first instance, be kept well covered with the water dressing protected by oil silk, until the surface begins to give way, and presents numerous small, yellow points of matter; it should then be dressed with strips of lint smeared with the yellow basilicon ointment, covered outside with linen, moistened with Condy's fluid or carbolic oil, if there be any offensive odor. After the slough of dead tissue beneath the skin has separated, the sore may be dressed with zinc ointment. The diet should be full and nutritious, with a moderate allowance of stimulants. The medicines that will be useful will be quinine, compound tincture of bark, muriated tincture of iron, etc.

Bowels, Inflammation of.—This is often ushered in by slight shivering fit, a degree of nausea with thirst, and a white, furred tongue with a red tip or red spots. There will be pain or tenderness of some parts of the abdomen, more commonly in the lower part or about the middle region. The pain is of a dull sort, except in the part that is most tender on pressure, where it will become acute and increased by bodily movements. The knees are generally drawn up in order to take off the pressure of the muscles of the abdomen. There is loss of appetite, sickness, sometimes vomiting, with increasing thirst, a coated tongue, and a hot, dry skin. The bowels are often obstinately constipated at the commencement of an attack of inflammation, and afterwards they become relieved even to diarrhœa. The character of the motions will vary—they are usually thin and watery, consisting of mucus and fæces, and are occasionally tinged with blood.

These symptoms are generally attended with a feverish condition of the system, as shown by a rapid, sharp pulse, thirst, heat of surface, &c. Inflammation of the bowels may originate in indigestible or undigested food; the action of irritant poisons, or of too active purgation.

TREATMENT.—Complete rest of body, and, as far as is possible, of the intestines, is the first and most essential point of treatment. The patient must be confined to the bed, and warm fomentations and poultices should be applied over the abdomen. Pain and diarrhœa may be relieved by Dover's powder—five grains every four or six hours, according to the severity of the symptoms, in cases of adults; for children, smaller doses may be cautiously given. If the pain be very acute, one grain of plain opium may be given every six hours. Turpentine stupes will be found useful. The constipation that sometimes ushers in an attack of inflammation of the bowels is often relieved by a few doses of opium. It depends upon spasm or cramp of the intestinal fibres. The diet should be of the simplest kind, soft and nutritious—e. g., milk, beef tea, mutton broth eggs, arrowroot, etc., in small quantities frequently.

Breast, Inflammation of (acute).—MILK ABSCESS.—SYMPTOMS.—A portion of the breast becoming harder than the rest, and having a throbbing pain, with slight redness of the skin. The hardness and pain extending, a degree of fever is set up. Shivering takes place, the throbbing increases—at last some one spot on the surface becomes softer as the matter which has been formed comes to the surface—the skin is thinned and gives way, if not opened by a lancet, and allows of the escape of matter, sometimes in large quantities.

Abscess of the breast occurs during the early weeks of nursing, and sometimes during weaning, sometimes through neglect in drawing off the milk when it is required to be done, and often without any known cause, and despite every care that may have been taken.

TREATMENT.—When only a small portion of the gland is affected, the application of cold lotion will sometimes disperse the inflammation, especially if at the same time the breast be drawn by breast-pump or drawing glass, and the breast be carefully supported by a sling made of a pocket-handkerchief, or band of any convenient kind. Should these means not have the desired effect of checking the course of the abscess, then warm poultices should be applied, or some folds of soft linen dipped in warm water and covered with oil-silk. From the first, a full diet, with wine or beer, is preferable to low diet, and any depleting or weakening treatment should be avoided.

After the matter has come to the surface, the continued application of poultices will cause the abscess to burst; and, if it points at one depending point, it is better left to take its course. If, however, it should not point freely at one spot, but at several, the opening of the most depending should be done by the lancet.

Chronic Inflammation of the Breast.—Sometimes at the time of weaning, a portion of the breast becomes tender and hard, but does not give the pain or produce the redness of "milk abscess." It occurs sometimes to young girls after mumps, and at the period of puberty. In women, at the change of life it also occurs. It readily follows also on a blow.

Treatment.—The treatment consists in improving or keeping up the general health. The less that is done to the breast in the way of local applications the better. The hardened lump often rapidly disappears of itself.

Bright's Disease.—Degeneration of the Kidneys.—Symptoms.—This is a disease of a very grave nature, and one which is seldom recovered from; but it is one of which it would be difficult to give an intelligent description to non-professional persons. Only the physician can treat it properly.

Bruises.—The variation of the colors of bruises is owing to changes going on in the blood which has been effused under the skin by violence. A bruise generally goes through all the various tints from black to green and yellowish-green. Bruises sometimes, from the large quantities of blood effused, become inflamed and form abscesses.

Treatment.—To prevent or diminish discoloration from bruises, it is well to apply cold or warm water as soon after the violence has been done as possible. To allay the swelling or inflammation which may follow, cooling lotions should be used. A mixture of tincture of arnica and water has been strongly recommended, but a mixture of spirit and water, or spirit, vinegar and water, will be found quite as efficacious. Spirits of wine, 1 oz; vinegar, 1 oz; water, to 4 oz.

Graze, or Abrasion.—An abrasion of the skin, or what is commonly termed "barked skin," is the simplest form of a wound. It consists in the superficial skin being rubbed off by violence. This form of injury of course varies in severity as the amount of violence varies.

Treatment.—For a slight abrasion a piece of linen or linen wetted with cold water and covered with oil-silk or gutta-percha tissue, will generally be sufficient dressing. Or it may be covered with gold-beater's skin.

For a graze or bruised wound of considerable extent or

depth, a dressing of carbolic acid and oil will be found a serviceable application. Take of carbolic acid, 1 part; best olive oil, 28 parts; apply on lint or soft linen.

In a majority of cases any simple application that will protect the denuded surface, while it is being skinned over, is enough—e. g., spermaceti ointment, spread on linen, will be all that is required. One method of treatment for abrasions, is to apply a piece of dry lint, and let the blood soak into it. This may be allowed to dry on the sore, and thus form an artificial scab; or the lint may first be soaked into compound tincture of Benzoin, known as Friar's Balsam.

Burns and Scalds.—The effect of these will vary with the extent of surface, or the depth of skin injured or destroyed. Recovery, moreover, must depend greatly upon the state of health at the time of the accident. Under ordinary states of health a superficial scald or burn, not destroying the skin below the surface, and not involving more than half the superfices, may be recovered from. Less than half of this extent of burn may, however, be fatal, if it extend to the true skin and the muscles below.

Burns as a rule destroy more than scalds. Scalds usually form blisters and go no deeper, but burns may char the deeper skin and the muscles beneath; they are, therefore, the more dangerous of the two. Should the burn have resulted from the clothes catching fire, they should carefully be removed, so as not to break the blisters, which may be forming or formed, lest violence be done to the raw skin beneath, and, for the same reason, pieces of the clothing that stick to the surface should not be removed at the time. If the burn or scald be extensive, some stimulant, wine and water, should be given at once to diminish the effect of "shock."

Treatment.—The principle to be observed in the treatment of burns and scalds, is to cause a gradual diminution of heat in the part, not to allow it to cool too quickly. This is effected by protecting the burnt or scalded part from the air, by immediately dredging with flour, or covering with cotton-wool or oil. If the case is a slight one, these dressings may be left on for a day or two; but, if it be more severe, the damaged parts should be dressed with lint, spread with basilicon or resin ointment, or a mixture of equal parts of that ointment and spirits of turpentine. Another useful lotion for application to burns and scalds of slight extent, consists of "carron-oil," or, lime-water, 1 part; linseed-oil, 2 parts; well shaken together, and applied by means of strips of lint, or soft linen rag, soaked in it, and changed twice a day.

The Blisters.—How to be Treated.—It is generally

advisable not to cut the blisters which may be formed, as they protect the true skin under them; but, if the base of the blister shows symptoms of inflammation, it is as well to evacuate the contents, but, even then, to do it by means of a small prick, and to leave the skin on, so that it may protect the raw surface from the air. The black char of skin that is sometimes left should be poulticed with bread, or linseed meal and bread, till the slough separates. When this has taken place, there is left a surface of what appear to be little mounds of flesh, and these give out a discharge of matter. They are called granulations, and are the commencements of the process of healing. At times these granulations grow very rapidly and abundantly, rising above the level of the adjacent skin. This is what is commonly meant by "proud flesh." Their growth may be checked by gently touching them with stick of nitrate of silver, and dressing the surface with oxide of zinc ointment. Burns between the fingers, or in any place where two contiguous surfaces are likely to come in contact, should be separately dressed, and great care should be taken to keep the granulating surfaces apart, or they may grow together and produce deformity.

Opiates.—If there be much pain, it will be advisable to give opium, in the form of the tincture, as it will also allay nervous excitement. Tincture of opium, 10 minims; water, one teaspoonful every four hours. This dose, it should be borne in mind, is for an adult person.

Burns from Chemicals.—The destructive chemicals most likely to produce these accidents are sulphuric acid, or oil of vitrol; nitric acid, or aqua fortis; ammonia, and hydrofluoric acid; strong carbolic acid, and chloride of zinc. In cases of burns from any of these the parts should be well washed with water, in which a little bicarbonate of soda is dissolved, or soap and water in the case of the acids. Afterwards treat as in a case of inflammatory ulcer or ordinary burn.

Gunpowder Burns.—Explosions of gunpowder cause destruction of skin, and resemble burns or scalds in their effects. They should be treated in the same manner as burns, first removing particles of carbon by means of a soft sponge and warm water.

The diet, in severe burns, should be supporting. Some stimulant is usually advisable.

Cold.—Either one or other of the following remedies is likely to succeed. Put twenty to thirty, or even thirty-five, according to age and strength, drops of laudanum in a tumbler of cold water. You can add a few drops of peppermint or half a glass of sherry to take away the nasty taste; but the effect of the laudanum is just the same. Sip it slowly for an hour or

an hour and a half before going to bed, as if it were wine, and as if you liked it. Do not go out again the same night, but go to bed pretty early. The chances are you will be perfectly well in the morning.

In case you are afraid to take laudanum, though it is but an idle fear, adopt the following recipe:—Before going to bed, put the feet in hot water, and have a warm bed. As you step into bed, or just after it, take either a Dover's powder in a little preserve. or a teaspoonful of sweet spirits of nitre in a teacupful of hot milk; cover up with extra blankets or rugs. Either one or other of the remedies will produce violent perspiration, which will probably bring about the desired effect. If all else fails, try a Turkish bath.

Another remedy—whose value is as yet unknown to the medical profession—for colds, viz. aconite, either in tincture or pilules, one every four hours, often produces an excellent effect; and gives relief as soon as, or sooner than anything else.

Chapped Hands.—After washing the hand, and before drying them, pour over the backs of them some glycerine and water (equal proportions), smear it over them, and then quickly dip it into water and dry the hands gently, so as not entirely to wipe off the glycerine.

Chest, Inflammation of.—Varieties.—This term would include pneumonia, or inflammation of the substance of the lungs; bronchitis, or inflammation of the air tubes going to the lungs; and pleurisy, or inflammation of the thin membrane which covers the lungs and lines the chest. It requires medical knowledge to distinguish these one from the other, but as they have many symptoms in common they are here, for facility or domestic treatment, classed together. The following principal distinctive features of each may, however, be of some use:

Symptoms.—In pneumonia, or inflammation of the lungs, there is a dull aching, or more severe, pain at some parts (usually the lower part) of the chest; difficulty of breathing, with a frequent short cough with very little expectoration, which will probably be of a rusty color or slightly streaked with blood. There is also a difference in the two sides as to the ease or discomfort of lying down. The skin dry or pungently hot, and in feverish state.

In bronchitis the pain is more extended but less acute, and the fever runs less high, the tightness of breath less; expectoration is looser, and frothy.

In pleurisy there may be no cough at all, the fever less active; but the pain is cutting and acute, and usually referable to a spot or limited part, and increased by coughing, etc. The

pulse will be accelerated in each, the tongue furred, the bowels disturbed in their functions, the urine high colored and depositing a red sediment.

Inflammation of the chest generally begins with the symptioms of catarrh, or of a severe cold; when the inflammation, however, affects the substance of the lung or its covering, the previous catarrhal stage is often short or entirely absent. The pain and ferverish symptoms appear at once. The tendency of these forms of inflammation of the chest is to recover under ordinary care; but pneumonia sometimes goes on to abscess, bronchitis may run on into a chronic form, and cause suffocation by the profuse quantity of phlegm secreted. Pleurisy may terminate in the pouring out of a quantity of fluid into the chest.

Bronchitis.—This is the form of inflammation of the chest that is most prone to become chronic, and to recur as "winter cough" periodically, attended with profuse expectoration and shortness of breath. In aged people, the winter cough is prone to become seriously aggravated by severe weather, under which circumstances debility rapidly becomes extreme, and the patient becoming drowsy, and unable to relieve himself of the phlegm, dies from suffocation.

Treatment.—In the mildest form of bronchitis, or simple catarrhal fever, the treatment need be little more than what is practiced for a common cold, such as, for an adult: Ten grains of Dover's powder, taken at bedtime, and followed by some simple aperient early the next morning; or, three or four grains of James' powder at bedtime, together with warm bath or warm footbath, and warm drinks—such as tea, wine, whey, &c. If the cough persists, take of ipecacuanha wine, two drachms; oxymel of squills, 10 drachms. Mix. Take a teaspoonful three or four times a day. Apply also mustard plaster to the chest at bedtime. In the feverish colds to which children are very liable, the above plan of treatment may be pursued, reducing the doses to suit the ages of the little patients, avoiding the use of the opiate (Dover's powder) in their cases.

Treatment of Acute Bronchitis.—If the skin be hot, the cough urgent, and the breathing accelerated or oppressed and attended with pain, the surface of the chest should be enveloped with hot fomentations, or turpentine stupes, or mustard plasters. Should the pain be very acute in breathing, the painfal part might be painted with the blistering liquid and afterwards covered with wadding, or with spongiopiline, soaked in warm water. If the pulse be full and rapid, an emitic of antimonial wine may be given—viz., a teaspoonful every five

minutes until vomiting occurs, which is to be encouraged with draughts of warm water. If the fever be not very high, or if the patient be not very robust and strong, an emetic of ipecacuanha wine, given in the same way, should be preferred, as the antimonial emetic sometimes proves very depressing. After these first measures have been carried out, the expectorant effects of the medicines may be kept up by repeated small doses—e. g., ten drops of ipecacuanha or antimonial wine every three hours.

Acute bronchitis occurring in children is to be treated on the same plan. The following powder is useful for a child about two or three years of age, where there is much cough and fever; Take of powdered ipecacuanha, 1 grain; calomel, 3 grains; nitre, 12 grains; white sugar, 12 grains. Mix, and divide into six or eight powders, according to the age of the child, and the strength and severity of the disease. If the bowels are relaxed by the powders, the calomel should be omitted. A warm bath should be given morning and evening.

Treatment.—Chronic bronchitis, occurring mostly in constitutions impaired either by age or previous illness, requires a different treatment as regards diet and regimen, as also it demands more stimulant and tonic medicines. The frequent application of external irritants and stimulating liniments is more useful here than even in acute bronchitis. This may be effected by friction with compound camphor liniment, or hartshorn and oil, or spirits of turpentine, or the use of repeated mustard plasters, and occasionally blistering the chest.

Chicken Pock.—In the majority of cases this is a mere trifling malady, with little or no febrile symptoms. In many others it is preceded with a four-and-twenty or six-and-thirty hours' feverish disturbance. These symptoms usually subside on the appearance of an eruption of pimples on the body, face, and head. On the second day the pimples present small vesicles or bladders, containing a clear fluid like water. On the third or fourth day the vesicles contain opaque yellowish fluid; these dry and fall off in scabs during the next two or three days, leaving, generally, no trace behind. Sometimes, however, the skin is slightly pitted, especially if the spots have been scratched or picked.

Treatment.—This consists in a light diet, and the mildest aperient medicine, if even any be required at all. The disease is sometimes mistaken for modified small-pox, and vice versa. But it will be noticed that the vesicles of chicken pock stand on the pimple like a small bubble or bladder of water, and that they have little or no inflammation around their bases. In

small-pox, even when modified, there is always an inflamed base to the vesicles, which are flattened instead of globular. Chicken pock runs a much shorter course than modified small-pox. The latter seldom, even when most distinctly modified, lasting less than ten or twelve days; chicken pock seldom exceeding six or seven, and being mature on the fourth day.

Chilblains.—The best remedy for these, when not broken, is to paint them twice a day with strong tincture of iodine.

A liniment of equal parts of extract of lead and spirits of turpentine is also very useful.

If inflamed and broken, they should be poulticed and dressed with some simple ointment.

Cholera:—English or Autumnal Diarrhœa.—SYMPTOMS.—In the heat of autumn it is very common that diarrhœa sets in suddenly, without any signs of previous bilious disorder. It is frequently accompanied by cramps of the legs, with nausea or vomiting; the tongue is furred, and great thirst is caused; the pulse is feeble; the loose motions are numerous—bilious at first—becoming more and more watery until they contain little more than mucus.

TREATMENT.—If there has been no indiscretion in diet to excite the attack, some warm and astringent medicine may be given at once; as, creasote, or chalk mixture, or tincture of catechu. (See Table of Medicines for the doses). If these fail to relieve the symptoms, a pill of one grain of opium will sometimes stop the looseness and relieve pain and sickness. This dose, however, should not be given to children. Should the attack be traceable to indigestible or improper food, a dose of castor oil should be given in the first instance. Opium or astringents may be given afterwards. The simplest diet should be taken, such as beef-tea, arrowroot, etc. Brandy may be given if there be signs of prostration or faintness.

Cholera:—Spasmodic, Malignant, or Asiatic.—SYMPTOMS.—This is usually preceded by a variable period of promonitory looseness of the bowels and a feeling of general indisposition, although there are many cases on record of its sudden accession without any warning. Such cases have generally been met with in hot climates. In the severe form of cholera the previous choleratic diarrhœa becomes altered in character; before this takes place, recovery is not unfrequent. The stools become watery, having a peculiar odor and "rice-water" appearance. The vomiting assumes the same character. There is a feeling of sinking and prostration, rapidly increasing. Cramps occur, beginning in the feet and hands, extending to the limbs and body. The features assume a sunken, contracted aspect, with a look of indifference in the countenance. The surface of

the body becomes cold and blue, or leaden-hued, and has a clammy sweat. The tongue partakes of the coldness of the surface. There is great thirst. The pulse feeble, soon altogether fails to be felt. The voice also acquires a feeble tone, being sometimes scarcely audible. The kidneys cease to act, and urine is suppressed, and complete collapse and death rapidly supervine, at periods varying up to two days on the average. Notwithstanding the feeling of coldness of the surface, the patient himself suffers from a sensation of burning heat internally, and craves for cold drinks. After the cold stage has lasted an uncertain time—it may be as long as forty-eight hours, if recovery takes place—it is followed by reaction and a febrile stage, which may run into a typhus condition, in which stage many cases prove fatal.

Treatment.—Everything here depends upon early treatment; half an hour's delay may determine a fatal ending. When cholera is prevalent a mere loose motion should immediately be attended to.

For the Preliminary Diarrhœa.—Immediately on the occurrence of diarrhœa, if there be any suspicion of its having been excited either by indiscretion in diet or impurity of water, half an ounce of castor oil should be given, and in three hours after its action it should be followed up with some astringent and sedative, as: For an adult, one grain of opium in the form of a pill every four hours, until the diarrhœa begins to decline. Or, chalk mixture, 1 ounce; tincture of catechu, 2 drachms every three hours. Or, creasote, 20 drops; spirits of salvolatile, 4 drachms; paregoric, 4 drachms; water, to 6 ounces. Mix. Give a fourth every three or four hours. Or, dilute sulphuric acid, 30 mins; tincture of opium, 10 mins; water, 2 ounces. Every four hours.

Mustard plasters on the pit of the stomach help to check sickness.

A light diet, consisting mainly of beef-tea, with small occasional doses of brandy. If these means fail, and the case go into the stage of collapse, external warmth in every possible way should be promoted. Bottles of hot water, heated bricks, bags of hot salt, etc., should be placed about the body and limbs, over which warm blankets should be covered. Copious draughts of cold water should be allowed to allay the thirst, notwithstanding that these may be rejected by vomiting. At the same time half a drachm of spirits of salvolatile should be given every two hours. The cramps are to be relieved by friction, or by pressure on the muscles that are cramped. When reaction takes place, the treatment must be gradually modified, with greater caution in the use of stimulants. If the febrile

reaction go into the typhus state, the case then requires the treatment of typhoid fever. (Which see.)

Clergyman's Sore Throat.—Symptoms.—An affection of the organs of the voice, to which public speakers are liable. It is not a sore throat in the ordinary sense of the term, but is an affection of the vocal organs extending to the surface of the throat. There is a relaxed and elongated state of the uvula. The surface of the back part of the throat has a reddish-purple and congested appearance. The throat becomes dry and the mucus tenacious, so that a constant hawking is occasioned. Hoarseness and difficulty in speaking follow. There is some pain felt in the seat of the organs of voice, and the voice becomes so altered that it is scarcely audible, or is harsh and discordant.

Treatment.—As this affection depends partly upon the state of the general health, its condition should be carefully looked to. There is, however, much to be done by the careful management of the respiration in public speaking, so as not to admit a rush of cold air upon the organs at the instant of using them. The lungs should be filled as much as possible through the nostrils, by which means the air is warmed and the force of its entry in inspiration is moderated.

There are two remedies which have considerable power over the parts, viz.: the nitrate of silver, and sulphurous acid. The nitrate of silver may be freely applied with a mop of sponge on the end of a stick or piece of whalebone. Nitrate of silver, 40 grains; distilled water, 3 ounces. The sponge dipped in this solution should be applied to the congested surface of the throat. As, however, this does not effectually apply the remedy to the deeper seat of the affection, the organs of voice, a "spray apparatus" will be found much more effectual. Several convenient forms of the apparatus can be had of the surgical instrument makers, with directions for their use. The sulphurous acid solution is a very valuable means in these cases, when thus applied, twice a day, the inspiration of the spray being repeated for about twenty minutes each time.

Colic.—Symptoms and Diagnosis.—A severe twisting and griping pain in the bowels, accompanied with flatulence, sometimes with vomiting, and always attended with constipation. The pain is paroxysmal and comes on suddenly, and is rather relieved than aggravated by pressure, as would be the case in inflammation of the bowels, in which also the manner of the attack is different, being in general less sudden in the onset, and constant. In colic the tongue is not necessarily furred, nor is the pulse quickened, both of which conditions

will be found in inflammation of the bowels. In one obstinate form of colic the action of the bowels becomes reversed, and vomiting of the motions may take place. In such a case it should be clearly made out that no rupture or internal strangulation of the intestines exists. It is to be observed that a mere muscular pain may be mistaken for colic or for inflammation—the latter; it may be added, more likely than the former to be the error that is committed.

TREATMENT.—The cause of this painful malady being generally the irritation of some indigestible or acrid food—such as unripe fruit, poisonous fungi, uncooked vegetables, sour drinks, etc.,—these should be removed as quickly as possible, by a full dose of castor oil, with from twenty to forty drops of laudanum for an adult, repeated every three or four hours if need be. At the same time hot fomentations or turpentine stupes should be applied over the belly. A hot bath will often relieve pain and relax the spasm which causes both the pain and the constipation. If flatulence be a predominant symptom, it is very likely the cause of the spasm of the bowel. In that case, the following will probably give relief:

Rhubarb powder, 20 grains; carbonate of magnesia, 30 grains; spirits of nutmeg (or peppermint), 1 drachm; spirits of salvolatile, 1 drachm; water, 2 ounces. Taken as a draught, and repeated in four or five hours if the colic continue. A dose of laudanum may be added. This same mixture, in reduced doses (omitting the laudanum), will serve well for the flatulent griping to which infants are liable.

PAINTERS' COLIC—Being caused by the poisonous influence of white lead (used in their trade), the treatment varies somewhat. White lead (carbonate of lead) being the poisonous pigment that forms the basis of most paint, is rendered inert by being converted into sulphate of lead.

TREATMENT.—This consists in the administration of sulphate of magnesia (Epsom salts) with alum and laudanum. Thus—Epsom salts, 2 ounces; alum, 1 drachm; laudanum, 80 minims; water, 8 ounces. Mix. Give an eighth part every three or four hours, until the bowels are purged and the pain relieved; other local means, as above mentioned, being also employed. Painters may almost entirely avoid the occurrence of colic by making it a point always to wash their hands before meals.

STRANGULATION OF THE BOWEL.—Closely allied to colic, and sometimes following upon it, is this accident, although it may occur from several conditions independent of colic. It is more frequently met with in young children than in adults, as an independent affection. Extreme obstruction of the intes-

tines, from an overloaded condition, may give rise to the same set of symptoms. It may be scarcely possible to distinguish between them, except by the result. Fortunately the treatment may be the same.

SYMPTOMS.—The symptoms are: Frequent desire to empty the bowel, without success; severe pain, usually at some one spot, with extreme tenderness in that part.

TREATMENT.—As soon as the fruitless nature of the attempts to evacuate the intestines are apparent, all purgatives should be withheld. Clysters of large quantities of warm water, or of warm olive oil, should be passed gently into the bowel. By persevering with these, the obstruction is sometimes overcome, and if the cause of the obstruction be loaded bowels, relief will pretty surely follow. The obstruction may last for several days, and yet give way to this simple and unirritating mode of treatment. Vomiting and nausea generally attend these cases, which may be relieved by pieces of ice and small quantities of champagne, or soda-water and brandy.

Concussion of the Brain.—SYMPTOMS.—This condition may be the result of either a fall, or blow on the head, or it may be occasioned by a violent jerk to the body, especially to the lower part of the spine. After one or other of these accidents, the symptoms of concussion will be: Unconsciousness, and loss of power of moving; a small and feeble pulse; the pupil of the eye insensible to the light; the complexion pallid; skin cold, and there may be vomiting. Convulsions, also, are likely to occur if a child is the subject of concussion.

TREATMENT.—Small quantities of stimulants, such as wine, brandy, ether, or salvolatile in water, should be given every half hour, if the patient can swallow, until signs of reaction begin to show themselves. This will be known by the restoration of warmth and color to the surface of the body, together with increased force in the pulse, and gradually reviving consciousness.

Congestion of the Brain.—SYMPTOMS.—Many very different sets of symptoms are often included under this one term. Thus, a "fit" is said to be caused by congestion of the brain, and so is a feverish condition with "head symptoms," so with a "stroke," so also with delirium.

It is indicated by headache, giddiness, unusual dullness of the mind, and of the senses of sight and hearing, or preternatural excitability, impairment of memory, noises in the ears, and a flushed countenance. There is feebleness or sluggishness of movement. The dullness may pass on into apoplexy, or paralysis, or convulsions; or the morbid excitabily may be but the precursor of inflammation of the brain.

TREATMENT.—The treatment must be modified very much by its causes. If from over use of the brain, change of scene, fresh air, and bodily exercise may be sufficient to dispel it. Shower-baths, with tonic medicines and mild aperients, will suffice. Sea-bathing, or plunging-bath, should be avoided, so long as there are any symptoms referable to the brain. If the dullness and heaviness persist, more active purgatives may be employed, and a rather more abstemious diet followed.

Constipation.—Costiveness of the bowels is a relative condition—with most persons in health the daily evacuation of the intestines is a habit, while others will allow several days to pass without experiencing any discomfort from sluggishness of the bowels. When this is prolonged beyond the ordinary period, various functional derangements occur—e. g., headache, dyspepsia, nausea, flatulent distention, etc.

TREATMENT.—The graver cases of obstinate obstruction, if they can be made out to be the result of neglected constipation, may be relieved sometimes by hot baths, with repeated small doses of castor oil (a quarter or half an ounce every two hours), or by a pill composed of two grains of extract of aloes and two grains of hard soap, given also every two hours. At the same time clysters of warm soap and water with castor oil (two ounces of oil to a pint of warm soap and water) may be thrown into the bowels every two or three hours. The sickness meanwhile may be relieved by soda-water or champagne, or by swallowing small pieces of ice. The pain should at the same time be relieved by repeated small doses of laudanum (fifteen or twenty drops). It is to be noted that opium should not be given to infants or young children.

Consumption.—The approach of this disease is, as is well known, often most insiduous and gradual, so that its real existence may be masked and overlooked in its early stage.

SYMPTOMS.—The first symptom that will generally excite fear is cough. If a young person, a member of a family wherein consumption has been known to occur, has a dry, irritable, ringing cough, or a short, moist cough every morning, and lasting for some time, suspicion should be excited. The cough continuing, some "tightness" in breathing is expressed, and a general derangement of the health follows, with some loss of flesh and strength, disinclination to exertion, dyspepsia, costiveness. Irregular mensturation commonly attends the approach of consumption. The cough occasionally, but not commonly in this early stage, is accompanied with a slight expectoration of blood, and with "stitches" in the side, or partial attacks of pleurisy. These early symptoms may last a variable time, and their true import be overlooked until on some one occasion a

profuse bleeding from the lungs, or "breaking a blood-vessel" in popular language, occurs and draws attention to the real cause of all the previous ill health. An attack of inflammation of the lungs, or of pleurisy, may also occur. Or, as is the more common course of the disease, the cough becomes more frequent, and is attended with thick, copious expectorations; the emaciation becomes more striking; the pulse increases in frequency, and is more feeble; the patient suffers from chills, and flushes of the face and hands.

As the disease advances these symptoms become more pronounced as hectic fever; diarrhœa becomes a troublesome symptom; there are profuse night sweats, and rapidly increasing debility. In the face of all these signs of an approaching fatal termination, the patient indulges himself with false hopes of recovery, and dies sometimes with projects and schemes for the future on his lips.

Treatment.—So far as the causes are under control, all prejudicial habits or conditions should be avoided by the patient; all dissipation or excessive work, either bodily or mental. Regular outdoor exercise, with due protection of the surface of the body, and of the lungs also, by respirators in cold weather, avoiding especially sudden change from heated rooms to cold air. Cold sponging and friction of the surface of the body will tend to promote the general health. A nourishing full diet should be taken, consisting of meat, eggs, milk; and, if there be wasting of the body, malt liquor and wine. Residence at the seaside will often so far improve the health as to retard the progress of disease; but change of climate is of little use unless adopted early in the course of the disease. It will then sometimes save or prolong a life. Temperate or cold climates are more suitable for consumptive patients than hot climates.

Of medicines, tonics are those which are most useful. In the early stages of the disease, iodide of potass is useful—e. g., five grains thrice a day with a drachm of tincture of bark. Cod-liver oil, with some mineral acid, thus: Dilute nitric acid, 20 drops; tincture of gentian, 1 drachm; water, a wine glass full, with cod-liver oil, one teaspoonful. Pain in the chest may be relieved by mustard plasters, or painting with blistering liquid. Tincture of iodine painted under the collar bones, in the earliest stages, diminishes cough and relieves pain.

Convulsions, or Fits, are, strictly speaking, symptoms, not a disease; thus they are seen in the low weak state of the termination of disease of various kinds; they are seen in hysterical excitement, and are caused by the disturbance of parturition, and of dentition. They occur in apoplexy, in epilepsy, and other diseases of the nervous system.

TREATMENT.—At the time of the convulsions but little can really be done—cold water may be dashed on the face, and mustard plasters applied to the soles of the feet and calves of the legs. In the fits of children—the child's body being immersed in a hot bath—cold water should be poured on the head from a jug held at a good height. The hot bath, however, cannot be repeated if the fits recur with frequency; the cold water can always with safety be poured on the head.

Corns.—Repeated soaking of the feet in hot water and paring down the corn with a sharp knife, then applying nitrate of silver, and afterwards paring off the hardened black skin. Corn-plasters, having a hole in the center, give great relief also in wearing. Soft corns are relieved by soaking in warm water, and the subsequent application of nitrate of silver. A thick plaster to take off unequal pressure, is extremely serviceable.

Cough.—See Bronchitis, Consumption, etc.; also List of Medicines, Expectorants.

Croup.—This is a disease which is alarming, from the suddenness of its attack and the rapidity with which its runs its fatal course if unchecked; but, on the other hand, in the majority of cases, it is easily checked if the treatment begins immediately it occurs.

SYMPTOMS.—The following is generally the course of the disease: A child is put to bed in its ordinary health, apparently, or it may have a slight cold, and a cough a trifle rough, but not enough to excite attention to it. After a variable time the child wakes up with a hoarse, ringing, rasping cough and difficulty in breathing, and countenance expressive of its trouble; each inspiration and expiration being attended with a rough metallic tubular sound, and the voice masked or obliterated by a harsh, hoarse, croaking vocalization. The cough is dry, harassing, and unattended with expectoration in the outset, but after awhile some portions of a membrane-like mucus may be coughed up. The pulse becomes rapid, the skin hot, the countenance more and more distressed, and if relief be not afforded, the patient becomes drowsy, the complexion becomes blue, and the little patient may die from suffocation within forty-eight hours. Happily, however, this is not the most common course of the disease, if the treatment be prompt and active.

The first thing to be done is to give a teaspoonful of ipecacuanha wine every ten minutes until vomiting occurs. Ipecacuanha wine is preferable to antimonial wine, as the latter is too depressing. (Where children are subject to croup, ipecacuanha wine should always be at hand.) Meanwhile, a hot bath should be prepared, and used as quickly as possible; and while

in the hot bath a wet sponge, sprinkled with mustard, should be held on the upper part of the chest and front of the neck. After the vomiting has subsided, small doses of the ipecacuanha wine (from five to fifteen drops, according to the age of the child) should be continued every three hours, until the hoarseness in the breathing and voice ceases and the cough becomes loose. The atmosphere of the bedroom should be kept warm and moist by steam from a pipe or spout of a kettle. The temperature should not be allowed to fall below 60 degrees, if possible. The diet light and simple.

As a last resource, supposing these remedies are not at hand or obtainable, and the disease is making rapid strides, life may be saved by applying scalding water to the neck, holding it there on a sponge or flannel for a minute at least. This is a most extreme and violent means, but it is one by which the writer has seen a life saved.

Dandriff.—SYMPTOMS.—Scurf, or dandriff, consists in an exuberant exfoliation of the minute scales of the outer skin and sometimes forms an obstinate and annoying effection of the hairy scalp.

TREATMENT.—Rub in some mild ointment or pomatum, over night, and wash it out in the morning with soap. Or apply the following ointment at bedtime: Ointment of red precipitate, 2 ounces; balsam of Peru, 1 drachm, and wash it out the next morning with juniper tar soap.

Delirium Tremens.—SYMPTOMS.—Although one of the medical terms for the affection, *Mania a potu* (drunkard's madness) expresses its most common source, yet there are conditions of a very different nature to which occasionally its origin may be traced. Thus a predisposition to it is engendered by excessive mental anxiety or exertion, while it may also be excited by any cause of debility operating secretly and suddenly, such as loss of blood, a serious wound or injury, a severe mental shock. Symptoms sometimes follow on these, precisely resembling those seen in the ordinary delirium tremens, and it would be incorrect morally and medically to attribute them in such instances to the vice of intemperance. The symptoms generally appear suddenly, sometimes after a premonitory state of nervous restlessness, with disturbed sleep, loss of appetite, and general derangement of the bodily health.

TREATMENT.—Where the cause has clearly been intemperance, the first, and, indeed, the cardinal point in the treatment, is to get the alcohol that has caused the disease withdrawn from the system. It is usual to administer freely of stimulants; which plan possibly arose out of the proverbial treatment of hydrophobia—"a hair out of the tail of the dog that bit you."

The practice is contrary to reason, and has not the results of experience in its support. The system being already more than saturated with alcohol, it is surely heaping Pelion on Ossa to administer more. The practice further places the victim of his own bad habits at a disadvantage, by robbing him of the opportunity of breaking them off. Too often, indeed, whatever pains may be taken to restrain him, "the sow that was washed will return to her wallowing in the mire;" but no reason is thereby supplied for holding the poor beast down in the mire.

If the patient be preserved as much as possible from the sources of excitement, by being kept in a quiet and darkened chamber, protected by strong attendants from injuring himself or others, and fed with light nourishing diet, such as beef-tea, arrowroot, milk, eggs, etc., the delirium will gradually subside, and sleep will follow. This plan of treatment, which has been advocated by Dr. Wilks, of Guy's Hospital, has the great advantage over the usual systematic administration of heroic doses of opium, that it is safer. In the hands of non-professional persons, the attempt to cure delirium tremens by large doses of opium, must succeed only by the death of many patients. If, as the delirium subsides, the pulse be found feeble, ammonia may be given, or steel and quinine. In what has now been laid down in regard to the delirium of *mania a potu*, it is not intended to forbid the moderate use of stimulants and opiates in delirium arising out of other causes of delirium than drink. In the sleepless delirium of a brain exhausted by overwork, from shock, or by other debilitating causes, small quantities of wine or brandy, and doses of Dover's powder, may be advisable.

Dentition, Teething Fever, Irritation of the Brain.—The febrile disturbance attending the cutting of the first set of teeth, which process is not complete until the end of two years, is often very considerable, and, inasmuch as the symptoms produced by it not seldom resemble to a certain extent those of inflammation of the brain, they have been collectively termed "irritation" of the brain, although it would not be easy for those who employ the term to define it.

A febrile condition appears, the infant becomes restless and fretful, its rest is disturbed, its head becomes hot. The gums are swollen and hot. Sometimes there is sickness and diarrhœa, in other cases the bowels are found to be costive. One point of distinction between the disturbance of teething and that caused by inflammation of the brain, is that the soft space on the top of the head, if it still remain open, is not full and raised, but depressed and cupped. Another point to be noticed is the age of the infant. Dentition commences at very varying

periods—from the ages of three or four to upwards of twelve months—and is usually completed on or about two years of age, so that these symptoms occurring sooner or later must be regarded as depending upon some other morbid condition of the brain or its membranes. Before the teeth appear, their growth is often indicated by dribbling, which may appear as early as two months of age. Over-feeding or indiscreet dieting will sometimes produce the symptoms of brain disturbance. It should be borne in mind that the period of dentition is one of febrile disturbance in the constitution, and is calculated, in the event of the existence of any lurking taint of constitutional disorder, to be the occasion of its being brought out into activity. This being the case, and dentition frequently following near to the operation of vaccination, the letter has to bear the discredit of what probably neither the one nor the other alone would produce.

Treatment.—In the first place, use warm baths and mild aperients, such as magnesia or grey powder, with a light, careful diet. This will generally suffice to assist in removing the symptoms, which, however, generally quickly subside if the gum can be lanced.

Diabetes.—Considerable misapprehension of the meaning of this word exists in the minds of many persons. It is not every excessive secretion of urine that constitutes diabetes. In the sense of a disease, as here intended, it includes the voiding of sugar therewith persistently.

Symptoms.—This condition comes on very gradually and insidiously. The patient gets out of health, is weak, has a general feeling of malaise, why or how he does not know. This state of things continuing for some time, he begins to notice that he voids more urine than usual, and at last perceives that very large quantites are voided. Then loss of flesh to emaciation becomes observable, as also thirst, with dryness of the tongue, which exhibits great fissures in its length. The breath acquires a smell like fresh hay. The skin becomes harsh, the bowels constipated. There may be some pain in the loins.

Treatment.—The principal part of the treatment resolves itself into rigid dieting, which should consist in the exclusion of sugar in all its forms, and in the use of animal food, mainly —e. g., meat, eggs, milk. "What to eat, drink, and avoid," becomes almost the business of life, in some cases of diabetes. We may briefly enumerate some rules for the guidance of choice in diet.

What to Eat and Drink.—Bran bread, gluten-bread; mutton or beef; poultry, game; ham, sausages, brawn; white-fish, shell-fish—e. g., oysters, lobsters, crabs; green vegetables

and salads; water, milk, tea, coffee; claret, sherry, brandy and water. Condiments, e. g., vinegar, pickles, mustard, salt.

What to Avoid.—Ordinary bread, potatoes, farinaceous substances generally; sweet fruits and pastry of any kind; malt liquors and sweet wines. These rules of dieting should be rigidly observed by young subjects of diabetes; they may be somewhat relaxed in the cases of aged persons. The surface of the body should be protected by warm flannel undergarments; the sponge bath, with brisk friction, should also be employed to promote the circulation in the skin.

Medicines.—The only medicine that can be administered with any certainty of benefit is opium. This may be given in the form of pills, half a grain three times a day, or as Dover's powder, five grains three times a day. The dose may be safely, if very cautiously, augmented.

Diarrhœa.—As a symptom of bilious disorder, and as constituting the prominent feature of English or Asiatic cholera, this complaint will be found treated of under those heads. There is, however, a common form of the disorder, which appears very often in hot weather, without any other indication, and which, if neglected, will lead to fully-developed cholera, if that disease or its causes be at the time prevalent; while, on the other hand, it is easily arrested if taken in time.

Treatment.—For an ordinary attack of diarrhœa—not arising from any known cause, such as irregularity of diet—a dose of the common chalk mixture (one ounce), with a drachm of tincture of catechu, repeated every three or four hours, will generally prove sufficient. If otherwise, three or four drops of creasote, mixed with a teaspoonful of spirits of salvolatile in a wineglass of water, will check it.

If the diarrhœa be profuse, and attended with much pain, a single dose of one grain of opium (taken as a pill) will often be sufficient for the purpose of relieving pain and arresting the purging. This dose is for an adult only. Diarrhœa occurring in infants and young children is best controlled by one or two teaspoonfuls of chalk mixture, given after each loose purge. If it prove obstinate, the following will most probably be efficacious: Take a few chips of logwood and boil half an hour in half a pint of water. Mix two ounces of this decoction with half a drachm of powdered alum, and enough powdered sugar to sweeten it, and give a teaspoonful after each action of the bowels.

Diseases of the Eye.—Ophthalmia (inflammation of the eye). There are several forms of this disease, named according to the exciting cause of the inflammation. They are seen

in the following forms: Catarrhal; Purulent in children; Purulent in adults; Strumous, or Scrofulous; Rheumatic.

Catarrhal Ophthalmia (Mild or Catarrhal Inflammation of the Eye).—Symptoms.—There is a redness or bloodshot appearance of the eye, an itching and smarting pain in it such as might be caused by a grain of sand or dust. There is a certain feeling of stiffness in moving the ball of the eye, and some difficulty is experienced in looking at the light. There is also a profuse discharge of tears from the eye, which causes the lids to be glued together in the morning, when the patient wakes. If the disease becomes more acute, there is a discharge of thicker matter. Sometimes this form of ophthalmia terminates in the formation of vesicles on the eye.

Treatment.—The following lotion will be found useful: Sulphate of zinc, 3 grains, dissolved in distilled water, one and a half ounces. A drop or two of this lotion should be carefully dropped into the corner of the eye, the lids being then parted, the lotion will run into the eye. If a small notch be cut along each side of the phial cork, the lotion can be allowed to pour out only a drop or two at a time. A dose of compound ipecacuanha powder (Dover's powder) at bedtime, and a few doses of saline aperient will generally set this form of inflammation to rights. If, however, the discharge should become thick, and the pain more severe, blistering should be applied to the temple.

Purulent Ophthalmia of Children.—Symptoms.—This generally commences on the second or third day after birth, and extends over the entire surface of the eye. There is swelling of the lids, which are glued together by a copious discharge of pus or matter, which, when the lids are separated, pours out from between them. On opening them, the inside of the lid is found to be of a bright scarlet color. The discharge from the eyes is generally yellow, but it becomes sometimes green, or tinged with blood. Should the inflammation not be properly and early attended to, it causes ulceration of the cornea or transparent circle in the centre of the front of the eye, and, if this occur, blindness follows.

Purulent Ophthalmia of Adults.—Egyptian Ophthalmia.—Symptoms.—This disease is very similar to the above, with these exceptions, that it generally attacks both eyes at once, and there is but little intolerance of light. In this disease also the inflammation sometimes spreads into the ball of the eye, causing thereby intense intermittent pain.

Treatment.—Purulent ophthalmia requires very much the same treatment, both for adults and for infants. It must be

stated, however, that this form of the disease in infants is catching. Great care should therefore be taken to wipe the discharge with pieces of rag which can be burnt directly. After applying the various remedies recommended, the hands should always be carefully washed.

The following lotion should be dropped into the eye as above directed: Nitrate of silver, 3 grains, dissolved in distilled rain water, one and a half ounce. (The solution of nitrate of silver will stain like marking ink anything it falls upon.) Blisters should be applied behind the ear on the affected side, or on the temples. For adults the following mixture should be taken: Epsom salts, 4 drachms; powdered nitrate of potash, tartar emetic, 1 grain; nitre, 30 grains; infusion of senna, 2 ounces; water to 6 ounces; a sixth part every four hours. The first dose or two may produce sickness; this will subside with subsequent doses, and is calculated to check the inflammation. To infants, a teaspoonful of fluid magnesia should be given every day, or more frequently if the bowels be confined. Should the pain be very severe, ten grains of Dover's powder may be given, but only to adults, as it contains opium.

Rheumatic Ophthalmia.—Symptoms.—A form of inflammation which attacks the thick white coat of the eye. The eye becomes of a dusky red, but not so much blood-shot as in the other forms. The fully distended blood-vessels can be distinguished radiating in straight lines from the edge of the cornea or transparent circular membrane in the front of the eye, which also becomes duller. There is excessive flow of tears, and great intolerance of light. In this form of inflammation the pain is more intense, and is not confined to the ball of the eye, but is felt in the surrounding bones of the forehead and cheek.

Treatment.—If the inflammation be very acute, it will be advisable to apply three or four leeches on the temples, and then to blister either in that situation, or behind the ear. The following aperient should be given at once, and repeated until it acts: Sulphate of Magnesia (Epsom salts), 2 drachms; powdered nitrate of potash (nitre), 10 grains; infusion of senna, one-half ounce; peppermint water, one-half ounce.

The following mixture should be taken three times a day, after the above draught has acted upon the bowels: Iodide of potassium, 40 grains; bicarbonate of potash, 80 grains; colchicum wine, 2 drachms; water to make 8 ounces. Two tablespoonfuls for a dose three times a day.

The following ointment should be applied round the eye, avoiding the raw or tender surface of a blister or leech-bites: Extract of belladonna, 80 grains; prepared lard, 1 ounce. Rub together.

Inflammation of the Cornea, or Transparent Circular Membrane in Front of the Eye.—Symptoms.—This membrane first appears slightly hazy. This haziness increases, and the membrane becomes slightly opaque. Minute white specks may be observed on the membrane; these, after a time, prove to be ulcers. Sometimes a yellow spot appears. This is a small quantity of matter which is contained between the layers of the membrane. If this is discharged inside the cornea, it falls to the lower edge, and may be seen there like a yellow crescent. It may, however, ulcerate through in front, and be thus discharged. Ulcers of the cornea, when healed, always leaves an opaque white spot. Sometimes they perforate the membrane, and thus allow of the escape of the fluid which is contained at the back of it. The eye all round the cornea is bloodshot; there is a bright scarlet ring close round the edge of the cornea.

Treatment.—This should be much the same as recommended for rheumatic ophthalmia, with this exception—instead of the iodide of potassium mixture, recommended for that disorder, the following will be found more useful in this case: Sulphate of quinine, 16 grains; dilute sulphuric acid, 1 drachm; syrup of orange peel, 1 ounce; water to make 8 ounces. Mix. Two tablespoonfuls should be taken three times a day.

Inflammation of the Iris, or Colored Band Round the Pupil of the Eye.—The iris is a muscle, and is largely supplied with blood by numbers of minute vessels, and therefore very liable to inflammation. The forms of inflammation which attack the iris may by divided into two kinds. 1st, that from which arises after injuries, over-exertion of the eyes, cold, and other common causes of inflammation. This is called Idiopathic Iritis. 2nd, those forms which are caused by the poison of constitutional diseases. This is called Specific Iritis.

Symptoms.—The symptoms both of idiopathic and specific iritis are mainly the same, with this exception—the symptoms of the latter kind show themselves rather more slowly than those of the former. There is a change of color in the iris itself, causing it to lose its brilliant appearance; it becomes muddy, or acquires a tint which is formed by the mixture of red with the original color. There is loss of power of motion, whereby the sharp outline forming the pupil is destroyed and becomes irregular. The substance of the iris is swollen, there appear little brown lumps or nodules on the surface of it, and these sometimes increase in size, so much as to block up the pupil. There is severe pain all round the ball of the eye,

affecting the cheek and temple. This pain becomes worse at night.

TREATMENT.—Idiopathic iritis: Three or four leeches should be applied to the temple; the light should be carefully excluded by means of a shade covering the eye; perfect rest of the eye is important. The patient should take for some little time a low diet of broth, bread, and gruel, or barley water.

The eyebrow should be painted with extract or ointment of belladonna.

One of the following pills should be taken every six hours by adults: Calomel, 3 grains; powdered opium, 3 grains; confection of roses, a sufficient quantity to make a small mass, to be divided into six pills. The effect of these pills on the gums should be carefully watched.

Dislocations.—The difference between dislocations and fractures is that in fracture the bone is broken, while in dislocation it is, as a consequence of some violence, forced from its connection with the neighboring bones. As we speak of compound fractures, or those which are accompanied by a wound, simple fractures, or those in which there is no wound of the skin, so in dislocations, these may be either simple or compound.

It is not always an easy matter to distinguish between a fracture and a dislocation. In certain forms of fracture, there is no crepitation or grating of the ends of the bones to be detected, as the same violence which breaks the bone drives the fragments forcibly together, and causes them to become impacted, or fixed together. In fractures about the region of a joint, the crepitation would be a main symptom by which to distinguish this injury from dislocation. Where it is absent, it is almost impossible for a non-professional person to come to a decision as to the real nature of the accident. Should, however, surgical assistance not be obtainable, the best plan to pursue will be to pull steadily at the injured limb until it resumes its shape and length. By this means, if the bones be dislocated, it may be possible to reduce the dislocation, and if fractured, it may, by loosening the bones, cause the distinctive sound of crepitation, and other signs of fracture, to be distinguished.

DISLOCATION OF THE JAW.—This may readily be detected by the imbecile appearance it gives the patient. The mouth is fixed wide open, and the saliva runs out at the corners. It is impossible to close the mouth, the patient making ineffectual efforts to articulate.

TREATMENT.—The patient should be seated in a high-

backed chair, or against a wall, in such a manner that his head may lean against the back of the chair, or the wall. The operator should then wrap a couple of napkins round his thumbs, one on each, and when by this means they are well protected, he should place them as far back along the jaw inside the mouth as he can reach. He should then press with his thumbs downward and backwards, and at the same time raise the chin with his fingers. The bone will return to its place with a snap. The advantage of having wrapped the thumbs well round with napkins will then be experienced; for the teeth come together very sharply, and, were the thumbs not well protected, bites of a severe character might be suffered. Another method pursued for the reduction of this dislocation is to place a couple of corks between the back teeth, raising the chin, and making the corks act as a fulcrum between the jaws.

Dislocation of the Shoulder Joint.—This may be distinguished by the evident lengthening of the arm and flattening of the shoulder. If compared with the other side there will be found a dent, or depression, just under the point of the shoulder. Frequently the round head of the arm-bone may be felt in the armpit.

Treatment.—The patient should sit on the ground and lean his shoulder against a sofa or couch; the operator should mount the couch, and, having removed his boot, should place his foot gently on the patient's injured shoulder; at the same time he should raise the dislocated arm upwards, gently increasing the pressure made by his foot on the shoulder. By these means the bone may soon be felt to slip into the socket with a jerk. When this is effected, the arm should be gradually restored to its original position, and there fastened by bandaging for about a week.

Hip Joint.—This dislocation may be recognized by the deformity of the limb, the inability to stand on the injured extremity, and, perhaps, the head of the bone may be detected out of its place under the skin.

Treatment.—The plan to be pursued is to place the patient on his back, the operator taking off his boot, and placing his heel between the patient's thighs, to make a steady pull at the foot till the bone slips into the socket. The great obstacle to success in this kind of proceeding, is the muscular resistance offered by the patient involuntarily. To overcome, or rather to divert this, the patient's attention should, if possible, be called away to something else, or, if this is of no avail, ipecacuanha should be given in doses of one-fourth to

one grain every quarter of an hour. By its nauseating properties it debilitates the patient and relaxes the muscles.

Compound Dislocations.—These, consisting of fractures also, are, of course, more dangerous than simple dislocations, and are rendered very serious if complicated with fracture.

Treatment.—The bones should be replaced as nearly as possible in their natural position, as in the case of simple dislocation. Any bleeding should be stopped, either by the application of cold water, or, if that is insufficient, bleeding arteries should be sought and tied. (See Hæmorrhage.) When the bleeding has been checked, the wound should be searched for splinters of bone, which should be removed by the forceps. The wound should then be dressed and splints applied, as recommended under Compound Fractures.

Dog Bites.—These are very much, though somewhat unnecessarily, dreaded, on account of the fear which exists that they may be followed by hydrophobia. When it is considered how many people are bitten by dogs, and how few people have hydrophobia, it will be seen of what groundless nature is that fear.

The best method of treatment which can be pursued in dog bites is to make a free application of lunar caustic to the bite.

Hydrophobia.—Although, as above stated, hydrophobia is excessively rare, its occasional occurrence cannot be doubted; it will therefore be advisable not to neglect the above remedies, as there is no doubt that the confidence inspired by their adoption soothes alarm, and prevents nervous excitement consequent on fright alone.

Treatment.—Should hydrophobia come on, chloroform, Indian hemp, and opium are the only means that offer any chance of allaying the symptoms. These drugs may, in such a case, be given in larger doses and at shorter intervals than under other circumstances, watching carefully their effects. (For doses, see List of Medicines.)

Dropsy.—This is purely a symptom of disease of some internal organ, or is the result of the debility and deterioration of the blood in certain eruptive fevers. As its nature and treatment occur in speaking of the diseases of various organs, it is unnecessary to speak here what is said under those several headings.

Drowning, or Suspended Animation.—The following instructions, compiled by the Royal National Lifeboat Institution, are the result of a wide field of experience:

Restorative Treatment.—Send immediately for medi-

cal assistance, blankets and dry clothing, but proceed to treat the patient instantly, on the spot, in the open air, with the face downwards, whether on shore or afloat; exposing the face, neck, and chest to the wind, except in severe weather, and removing all tight clothing from the neck and chest, especially the braces. The points to be aimed at are—first, and immediately, the restoration of breathing; and, secondly, after breathing is restored, the promotion of warmth and circulation. The efforts to restore breathing must be commenced immediately and energetically, and persevered in for one or two hours, or until a medical man has pronounced that life is extinct. Efforts to promote warmth and circulation, beyond removing the wet clothes and drying the skin, must not be made until the first appearance of natural breathing. For if the circulation of the blood be induced before breathing has commenced, the restoration of life will be endangered.

To Restore Breathing.—Place the patient on the floor or ground, with the face downwards, and one of the arms under the forehead, in which position all fluids will more readily escape by the mouth, and the tongue itself will fall forward, leaving the entrance into the windpipe free. Assist the operation by wiping and cleansing the mouth.

If satisfactory breathing commences, use the treatment prescribed below to promote warmth. If there be only slight breathing, or no breathing, or if the breathing fail, then, to excite breathing, turn the patient well and instantly on the side, supporting the head; and excite the nostrils with snuff, hartshorn, and smelling-salts, or tickle the throat with a feather, if they are at hand. Rub the chest and face warm, and dash cold water, or cold and hot water alternately, on them. If there be no success, lose not a moment, but instantly—to imitate breathing—replace the patient on the face, raising and supporting the chest well on folded coat or other article of dress. Turn the body very gently on the side and a little beyond, and then briskly on the face, back again; repeating these measures cautiously, efficiently, and perseveringly, about fifteen times in a minute, or once every four or five seconds, occasionally varying the side. On each occasion that the body is replaced on the face, make uniform, but efficient, pressure, with brisk movement on the back between and below the shoulder-blades or bones on each side, removing the pressure immediately before turning the body on the side. During the whole operation, let one person attend solely to the movements of the head and of the arm placed under it. Whilst the above operations are being proceeded with, dry the hands and feet, and as soon as dry clothing or blankets can be procured, strip the body, and cover, or gradually reclothe, it, but taking care not to interfere with the efforts to restore breathing.

Should these efforts not prove successful, in the course of from two to five minutes, proceed to imitate breathing by Dr. Silvester's method, recommended by the Royal Humane Society, as follows: Place the patient on the back on a flat surface, inclined a little upwards from the feet; raise and support the head and shoulders on a small, firm cushion or folding article of dress placed under the shoulder-blades. Draw forward the patient's tongue, and keep it projecting beyond the lips—an elastic band over the tongue and under the chin will answer this purpose, or a piece of string or tape may be tied round them, or by raising the lower jaw the teeth may be made to retain the tongue in that position. Remove all tight clothing from above the neck and chest, especially the braces. To imitate the movement of breathing: Standing at the patient's head, grasp the arms just above the elbows, and draw the arms gently and steadily upwards above the head, and keep them stretched upwards for two seconds. (By this means air is drawn into the lungs). Then turn down the patient's arms and press them gently and firmly for two seconds against the sides of the chest. (By this means air is pressed out of the lungs.) Repeat these measures alternately, deliberately, and perseveringly, about fifteen times a minute until a spontaneous effort to respire is perceived, immediately upon which cease to imitate the movements of breathing, and proceed to induce circulation and warmth.

Treatment after Natural Breathing has been Restored.—Commence rubbing the limbs upward, with firm, grasping pressure and energy, using handkerchiefs, flannels, etc. (By this measure the blood is propelled along the veins towards the heart.) The friction must be continued under the body by the application of hot flannels, bottles, or bladders of hot water, heated bricks, etc., to the pit of the stomach, the armpits, between the thighs, and to the soles of the feet. If the patient has been carried to a house after respiration has been restored, be careful to let the air play freely about the room. On the restoration of life, a teaspoonful of warm water should be given; and then, if the power of swallowing have returned, small quantities of wine, warm brandy and water, or coffee, should be administered. The patient should be kept in bed, and a disposition to sleep encouraged.

Appearances which Generally Accompany Death.—Breathing and heart's action cease entirely; the eyelids are generally half closed, the pupils dilated, the jaws clinched, the fingers semi-contracted, the tongue approaches to the under edges of the lips, and these, as well as the nostrils, are covered with a frothy mucus. Coldness and pallor of surface increases.

CAUTIONS.—Prevent unnecessary crowding of persons round the body, especially if in an apartment. Avoid rough usage, and do not allow the body to remain on the back, unless the tongue is secured. Under no circumstances hold the body up by the feet. On no account place the body in a warm bath unless under medical direction, and even then it should only be employed as a momentary excitant.

Dysentery, Bloody Flux.—This is an inflammation of the larger and lower intestine, more commonly met with in hot and unhealthy climates, and on board of ships. It is ushered in with almost incessant desire to go to stool. The motions, hard and lumpy at first, become little more than blood and mucus, and are voided with painful straining. The pulse is rapid and feeble, the skin hot, the countenance anxious, the patient restless. In the worst cases the disease becomes chronic, and the patient is worn out by the pain and fever, or sinks rapidly into a state of collapse.

TREATMENT.—A condition essential to the success of treatment is the removal of the patient, if possible, from the sphere of morbid influences that have predisposed him to the disease. Hence the importance of removal to a healthy situation, at the same time that the strictest care and temperance in mode of life be observed, and the protection of the surface of the body by warm flannel clothing. The early and acute symptoms may be subdued by hot baths, hot fomentations, and turpentine stupes to the abdomen. Half an ounce of castor oil should be given, and after it has acted and cleared away any hard motions, five grains of Dover's powder should be taken every four or six hours, according to the urgency of the case; with two grains of mercury and chalk if the motions still contain lumps of hardened fæces. The painful straining at stool is relieved by the injection into the bowel of twenty drops of laudanum mixed in a wineglassful of cold gruel or starch. A gentle aperient at the end of a few days will assist the above remedies by removing morbid secretion and bloody mucus. A nourishing but light diet should be taken, avoiding all hard substances, and for sometime avoiding solids of any kind until the healthy action of the intestines is restored.

The chronic form of the disease requires the continual use of metallic astringents with opium—e. g., Sulphate of copper, 3 grains; powdered opium, 2 grains; bread crumbs, sufficient to form a small mass. To be divided into six pills, one to be taken every six hours. Or: Acetate of lead, 12 grains; powdered opium, 2 grains. Made into pills in the same way, and one to be taken every six hours.

Ear-ache.—SYMPTOMS.— Deafness, pain and noise in the

ear, are often produced by the mere accumulation of wax in the ear.

TREATMENT.—It will generally suffice to clear out the passage by syringing. A large syringe and plenty of water should be used. If not relieved in this way, the application of repeated mustard plasters behind the ears will have a good effect.

Ear, Inflammation in.—IN INTERNAL EAR.—Inflammation in the ear will be inferred from the occurrence of a severe, dull pain in the head, where the ear is placed, accompanied with confusion or loss of hearing, a considerable degree of fever, and even of delirium, if the inflammation be seated in the internal ear.

TREATMENT.—This, in the first case, should be active—e. g., six or eight leeches should be applied behind the ear, followed by hot poultices or fomentations. Brisk purgation should be adopted, while at the same time pain may be relieved by opiates taken internally.

Inflammation in the passage should be treated by poulticing, and a few drops of laudanum in the passage.

Epilepsy—Consists in the concurrence of the sudden loss of consciousness, with more or less convulsive movement of the limbs. In proportion as the two are slight, and the convulsion wanting, the disease has been divided into two forms, called by French writers the petit mal and the grand mal.

The grand mal, the full epileptic fit, is the sudden loss of consciousness and of muscular power, so that, with a shriek, the patient falls to the ground senseless, and is violently convulsed in the limbs, with great distortion of the countenance, lividity of the face, frothing at the mouth, the eyes staring and pupils large, and not answering to the stimulus of light, the breathing labored, appears even to be suspended, while the heart beating so tumultuously that the pulse cannot be counted. In consequence of the tongue being protruded, it is bitten in the violent, convulsive movements of the jaws. The excretions often pass involuntarily. This, the full fit, seldom lasts longer than a few minutes. When it passes off it leaves the patient in a drowsy state, in which he may remain for several hours. The fit may recur during this sleeping state.

The slighter form frequently consists of little more than a slight and rapidly passing condition of unconsciousness or mental confusion, with a varying degree of want of muscular power, so that there may be some unsteadiness of gait or imperfection of vision, and numbness of parts of the limbs. This form usually passes away in a few seconds, and may not well be perceptible to those around, the patient himself being scarcely aware that anything has been amiss with him.

Symptoms.—There are certain, or rather they should be called uncertain, premonitory symptoms that sometimes usher in an attack of epilepsy. The most known of these is a peculiar and indescribable sensation, originating in the extremities and passing up towards the head; this has been termed the "epileptic aura," or vapor. Other indefinite derangements, referred to the nervous system, frequently precede the fit; but, in by far the majority of cases, the fit is sudden and without warning of any kind. A great many fits may occur daily.

Epileptic fits are somewhat difficult sometimes to distinguish from hysterical fits, and from the convulsive movements of apoplexy. In the former case the diagnosis may be made by considering the history of the case, and the absence or presence of hysterical laughing and crying. From apoplexy it may be distinguished sometimes by the dilated state of the pupils in epilepsy, and by the profound snoring and paralysis that commonly attend apoplexy.

Treatment.—Protect the patient during the fit from injuring himself. Loosen the dress around the neck and waist, and place him on a bed or couch, with the head and shoulders slightly raised. Sprinkle the head and face with cold water. It is in the intervals of the fits that curative or preventive treatment must be pursued. The exciting causes of dentition, worms, constipation, intemperance, indulgence of passions, etc., should be sedulously avoided or remedied. Tonics may be given, and every measure that can improve the general health should be put in force.

Fainting.—Swooning occurs generally from sudden shock, or from large and sudden loss of blood, or any other cause of depression, mental or bodily, such as profuse diarrhœa and affections of the heart.

Treatment.—The patient should be laid flat on a couch or on the ground, with the head as low as possible; the face should be sprinkled or dashed with cold water, free access of fresh air being secured. If able to swallow, let some stimulants be given, such as a small quantity of wine, brandy, or spirits of salvolatile, and apply strong smelling salts to the nostrils.

Fractures.—These are, for convenience of description, divided into several kinds.

1. Simple Fracture.—The bone being merely broken in one place, without any wound of the skin at the seat of the fracture.

2. Compound Fractures—In which, over and above the fracture of the bone, there is a wound in the skin, through which, perhaps, a portion of the broken bone may be forced.

3. Comminuted Fracture.—The bone being broken into several pieces.

4. Compound Comminuted Fractures.—The bone not only being broken into several pieces, but a wound also existing in connection with the fracture.

When a severe accidend happens to a limb, it is often difficult to say what is its exact nature—whether a bone is broken or bent, the joint sprained, or the bone dislocated. The following few points may assist in the detection of fracture, if it exist:

Deformity.—This, with shortening of the limb, is sometimes so obvious that there can be no mistake, as, when the arm is so broken that its firmness is lost and the broken portions move on each other. Or when the leg is broken, the fracture is generally rendered evident by the outline of the shin bone. In the latter case, also, as in the case of the fracture of the thigh-bone, if the patient be laid on his back the foot of the broken limb will be seen to be wanting its support, and will fall to one side or the other. The loss of power over the limb will also be some guide, though this will be noticed also in dislocations.

If, however, the limb supposed to have sustained a fracture be carefully taken hold of by both hands and gently moved about, it will, if broken, be found to give way at some one point, where also what is technically termed crepitus or grating, of the broken ends of the bone may be felt.

General Treatment of Fractures.—The one most important point in the treatment of broken bones is to secure absolute rest of the member to which the fracture may have happened. The utmost care is required in removing the patient from the spot where the accident has occurred to his bed, or more harm may be done in the removal than was done in the first instance. From a simple fracture the injury may become compound, or even comminuted, if care and gentle handling be overlooked. In all cases the bones should be brought as nearly as possible into their natural relative positions. This is called "setting" the bone. "Setting" the bone is effected by one person steadying the portion of the limb attached to the body, while a second person firmly but gently pulls on the other end until it resumes its proper position. The difficulty of effecting this will depend much upon the direction in which the bone is broken, whether transversely or obliquely.

Splints.—This being done, the next thing is to take means

for keeping them in position. This is to be effected by a "splint" of some kind. Where proper splints, made by surgical instrument makers, cannot be procured, there are many things often at hand which may be improvised into what is wanted. Thus, long, straight straws, placed and bandaged on, side by side, will form a clean and handy splint. Pieces of straight wood, cut to proper length and shape, and covered with a soft pad; pasteboard, or any other stiff material, fastened on with bandages, not too tightly. When the ends of the bone in a simple fracture are easily set into their normal positions, a good and ready splint may be made out of plaster of Paris, or gum and chalk, or white of egg and flour. Either of these two last being spread upon strips of rag, and several strips laid one over the other, will soon dry into a case as hard as board, and from which it may not be necessary to remove the limb until the cure is complete. Before putting this or any other form of splint on the broken limb, the skin should be well washed with warm soap and water.

If the fracture be compound, a portion of the bandage must be so arranged as to allow of water dressing and the drainage of discharges. In the case of comminuted compound fractures, if any pieces of loose broken bone be visible, they should at once be removed by the help of forceps. Diluted Condy's fluid, or carbolic acid and oil (one part of acid to twenty-eight of oil), will be found of great use in dressing compound fractures, as they destroy the injurious effects and fœtid odor of the discharge.

Arm Bones.—If both bones be broken, a splint and bandage as follows: Care must be taken that the palm of the hand is flat to the chest, with the thumb uppermost. Or it may be put up in strips of linen thickly smeared with a paint of chalk and gum, or eggs and flour. Unless severe pain occur the bandage need not be removed under four weeks. A handkerchief, adjusted as a sling, should support the arm.

If one bone of the arm only be broken, the other bone will act, in some measure, as a splint to keep the broken bone in its position.

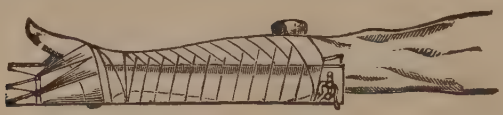
If the upper or large bone of the arm be broken, the lower arm, from the elbow, should be supported in a sling; or the shaft of the bone being bound by two or four splints, may be bandaged to the side of the body, as shown in the cut.

Fracture of Arm Above the Elbow.—This can generally be recognized by the deformity which it produces. The bone should be placed in its proper position in the following manner: One person should steady the shoulder while another person should firmly draw the elbow downwards, until the arm is straightened. When this result is obtained, the bones should be kept in their proper position by means of four splints, which should be well padded and applied round the arm; these should be firmly fastened with a couple of straps, or bands of adhesive plaster. Before the splints are applied, the arm should be well washed with soap and water, and dusted with powdered starch or oxide of zinc. It is advisable not to put the splints on too tight at first, in order to allow for swelling. They may be tightened after a day or so. Fractures of this bone require the splints to be kept on for six weeks.

Fracture of the Arm Below the Elbow, or Forearm.—Both the bones of the forearm are generally broken together; but it sometimes happens that only one of them is broken. In this case it is not always easy to discern the nature of the accident, as the uninjured bone will act as a splint to the other, and help to disguise the ordinary symptoms of fracture. Crepitation, may, however, generally be detected by taking in one hand the arm at or below the elbow, and gently rotating the hand on the arm. The bones, if displaced, should be set, that is, replaced in their proper position, by gently drawing the hand in a straight line from the elbow, which, for that purpose, should be held by an assistant. When the bones are set, the arm should be well washed with soap and water, and dusted with powdered starch or oxide of zinc. Two well padded splints should then be applied on each side of the arm, and strapped down with plaster. After this, the whole arm should be placed in a sling, taking care that it is

always carried with the palm of the hand towards the body, that is, with the thumb uppermost. The reason of this is that, in that position the two bones are furthest apart, and there is no danger of the wrong bones uniting. The splints should not be too tight to begin with, as the arm will swell a little at first; they should, however, be gradually tightened as the swelling subsides. The most common fracture in this region occurs just above the wrist, and in this the deformity is very great.

The splints in fractures of both bones of the forearm should not be removed under five weeks; if, however, only one bone is broken, four weeks will suffice.



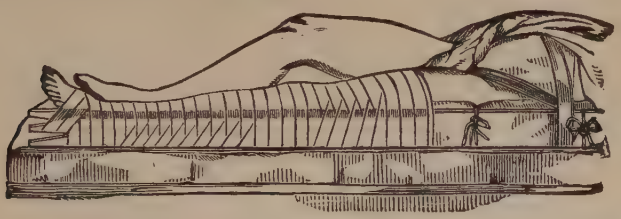
Fractures of the Fingers and Hands.—When any of the bones of the fingers are broken, they are best treated by placing the whole hand, sandwich fashion, between two well padded splints, strapping them together by means of leather straps or adhesive plaster. When the bones in the middle of the palm of the hand are broken, the patient should be made to grasp a ball of tow, or cotton-wool, and the hand should be bandaged in that position; but if either of the outside bones are broken, the hand should be put up as described under "Broken Fingers."

Fractures of the Thigh.—These may be recognized by the great deformity, the limb being generally shortened, the inability of the patient to stand on the injured leg, and the unnatural mobility of the limb. The proper treatment of fracture of this bone can scarcely be efficiently applied by a non-professional person.

Fracture of Leg Below the Knee.—In this region there are two bones; one, which is commonly called the shin-bone, may be distinctly felt down the front of the leg, and for about an inch on the inside of the leg. The other, which is much smaller, is on the outside of the leg, and forms the outer ankle. It can only be felt distinctly in two spots, the one where it forms the prominence of the ankle, and the other where it is attached, just below the knee-joint. In the intermediate space it is embedded in the muscles, and, except with persons of exceptionally small calves, cannot be detected. For the above reasons it will be seen that fractures of this bone are far more difficult to detect than are fractures of the shin bone, whilst fractures of both bones are comparatively easy of

detection from the deformity they cause. In fractures of both bones, or of the shin-bone alone, the patient should be placed in bed on his back, with the broken leg supported upon a pillow, and should remain so until any swelling of the leg has gone down. If only the outer, or smaller, bone is broken, a few days rest will allow of the application of egg and flour, or gum and chalk bandage.

The larger bone, or both, being broken, a well padded splint may be applied up each side of the leg, extending to the foot, and bound on with a calico bandage, or by leather straps. The splint on the outer side must be cut away so as not to exert undue pressure on the ankle bone. A cross-piece may be fixed so as to support the sole of the foot at a right angle to the leg, by means of a few turns of bandage. Before the splints are finally bandaged on, care must be taken that the bones of the leg are placed in a straight position, and as nearly as possible to their natural position. This may be judged of by comparing the relative positions of the great toes. The setting of the bones may be effected by an assistant holding the thigh steady, while firm but gentle extension is made from the foot. If there be no displacement of the broken bones, the use of starch and egg, or gum and chalk bandages will give a firm support to the limb.



Fracture of the Knee Cap.—This may be distinctly felt over the knee joint by the space between the broken edges, and by the loss of power in extending the leg.

Treatment.—The limb should be put quite straight, and raised on a pillow. The patient should keep on his back. By these means the two portions of the bones will be brought as near to each other as possible. There will be great swelling of the part, which should be treated with cold water dressing. When this has subsided, two handkerchiefs should be placed round the leg, one above the upper fragment, and the other below the lower one, and these should be connected by pieces of tape. The handkerchiefs may be gradually drawn nearer and nearer together. The nearer they approach each other, the nearer the two fragments will come together, and the pieces will be firmly knit together. This position and bandaging

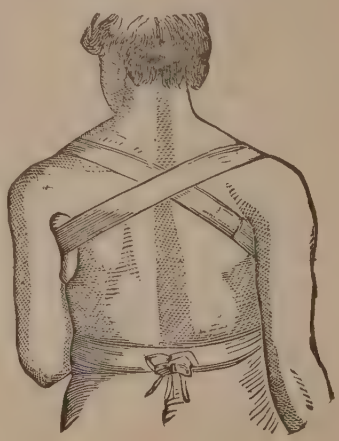
should be maintained for a month, at the end of which time the patient should be allowed to move the limb gently until he regains the use of the limb.

Broken Ribs.—The best method of detection of this injury is to place the hand over the painful spot, and to make the patient breathe as deeply as possible. By this means crepitation or grating caused by the rubbing of the fractured ends of the bone together, may be sometimes detected; but as it is by no means certain that this can be always detected, and as it is the only sign by which a broken rib can absolutely be detected, it will be advisable to treat in all cases of doubt as if there were a fracture.

Treatment.—The treatment of broken ribs consists mainly in procuring rest for the ribs. This is done by firmly bandaging with a calico bandage, three or four inches wide, the entire chest, so as to diminish the movement of the ribs in breathing. The patient should be kept in bed quietly on his back for a few days after the accident. Any pain should be allayed by Dover's powder or tincture of opium. If severe pain or distress of breathing come on, it probably results from pleurisy.

Broken Collar-bone.—When this bone is broken the patient cannot raise his arm without pain. The arm drops, and the patient supports it with the other hand; the shoulder also drops forward and inwards. On feeling gently along the collar-bone, comparing it at the same time with the same bone on the opposite side, the inequality of line at the point of fracture may often be detected.

Treatment.—The method of treatment to be pursued is as follows: The shoulder should be raised and pressed gently backward; a pad should be placed in the armpit. This pad should be about two inches thick, and is best made with a pair of stockings rolled up. A figure-of-eight bandage should then be applied, as in the figure. The arm on the injured side should be bound to the side with another bandage, and the hand and forearm placed in a sling. This bone should be kept in this position for four weeks, the bandage not being moved during that time, unless they slip or loosen, in which case they should be carefully tightened.



Bones of the Nose.—The broken fragments should be replaced as near as possible in their proper position. This may be conveniently done by raising them from the inside by means of a probe. If the fracture is compound—that is to say, if there is a wound communicating with the broken bones—this should be searched for splinters of bone, which should be removed by means of the forceps. Then apply water dressing.

Compound Fractures.—These are fractures in which there is a wound communicating with the broken bone. In cases of this kind the fractured limb after being set should not be encased entirely with splints, but a space should be left for dressing the wound, which should be done as follows: If there are any pieces of bone loose, or nearly so, in the wound, they should be removed by means of the forceps. The wound should then be dressed with a piece of soft linen rag steeped in the following mixture: Carbolic acid, liquified by heat, 50 minims; olive oil to 4 fluid ounces; shake up, and mix thoroughly. This rag should be applied in such a manner as to exclude all bubbles of air; the best way to do this is to cut the rag square and large enough to cover the entire wound—it does not signify if it overlaps the edges of the wound; soak it in oil, and then take hold of two of the corners of it and draw it slowly over the wound until it is covered. Any stray bubbles of air which may remain from the inequality of the surface of the wound should be gently pressed out by the fingers. This dressing should be changed every four or six hours. The limb should be kept cool.

The patient's health should be carefully watched, as in these cases fever very often comes on. Should there be any shivering, an aperient should be given. Thirst should be relieved by iced lemonade or soda-water, and a saline draught should be taken about three times a day. The following will be found most useful: Take of solution of acetate of ammonia, 1 drachm; sweet spirits of nitre, 20 minims: water to 1 fluid ounce. Mix. A compound fracture is always longer in recovering than a simple one, the process of restoration sometimes extending over many months, through the frequent falling off of small fragments of bone, each of which will keep up a discharge of matter until it is removed, either by the use of the forceps, or by the extrusion of the pus.

Ganglion.—Symptoms.—A swelling upon one of the joints, most frequently met with on the back of the wrist. Its seat is the sheath of the tendons.

Treatment.—Hard, steady pressure should be made upon it with the thumb of the operator's hand, that holds the arm firmly at the same time. If the pressure be made hard enough,

and kept up long enough, the tumor will generally burst and the fluid be dispersed. A tight bandage should be applied immediately afterwards and kept on a few days. Sometimes, if the ganglion be small it will give way under a smart, sharp blow with a book.

Goitre.—Derbyshire Neck. — Bronchocele. — SYMPTOMS.—Peculiar enlargement of a gland that is situated at the front and sides of the neck. The swelling, at first slight, and only amounting to a trifling degree of fulness, is prone to increase rapidly, and to cause inconvenience in breathing, as well as considerable disfigurement by its bulk.

TREATMENT.—The treatment consists in the amendment of the general health, by removal from any locality where the malady is known to prevail, or by remedies directed to correct irregularities of menstruation, to which also it is sometimes attributable. The best medicinal agents are iodine and steel, alone, or in their various forms of combination, with the external application of iodine as tincture, painted on the enlargement night and morning, until the skin becomes too irritable to bear it. The application can be resumed when the skin has recovered, or the iodine may be applied as ointment thus: Ointment of iodine of potash, 1 ounce; ointment of idoine of mercury, one half drachm. Mix. Apply night and morning.

Gout.—SYMPTOMS.—An attack of gout is generally preceded by disturbed digestive functions, broken sleep and feverishness. The symptoms of an attack generally come on in the course of the night. Severe throbbing pain in some joint, generally in the joint at the ball of the great toe, accompanied with great tenderness, sufficient to prevent the patient from bearing the least movement of the bedclothes over the joint affected. With these symptoms there is a feverish condition, with thirst, rapid pulse and furred tongue. The joint affected is red and swollen, the pains become more and more acute, extending sometimes up the leg, and the fever becomes more severe. This goes on until morning, when a perspiration breaks out, and the paroxysm is over. It, however, probably occurs again the next night, subsides, and recurs at intervals. The hands are liable to attacks of gout, and, after repeated recurrences, the finger joints become the seat of deposits of a white concretion, called "chalk stones," and are thus rendered stiff and useless. The disease may become chronic if not guarded against by careful dieting.

The heart or brain are either of them liable to suffer in this disease. In the event of the heart becoming the seat of an attack there is pain, with severe palpitation and difficulty of breathing. Nervous symptoms, such as headache, and

sometimes paralysis, or even apoplexy, may attend an attack of gout, and show that the brain is affected by the disease. Gout and rheumatism are often confounded. To distinguish between them the following points should be borne in mind: Acute gout is generally confined to one joint, and the pain is more acute. The constitutional antecedents differ. Gout is an hereditary disease. In the chronic form, these diseases are intermingled with each other, are not easy to distinguish in their acute form. There is a disease called rheumatic gout which combines the two so closely as to render necessary the name applied to it. To distinguish chronic gout from chronic rheumatism, it is necessary to remember that gout is hereditary, rheumatism is not generally so. The history of the attacks, the habits of life of the patient, must also be taken into account. If the patient is indolent, self-indulgent, and given to what are called the "pleasures of the table," the chances are that what he is suffering from is an attack of the gout.

TREATMENT.—In a person of the above habits, the premonitory attacks of indigestion, want of sleep, and feverishness, should be treated with three or four grains of mercurial pill (blue pill) at bed-time, and the following draught early the next morning: Powdered rhubarb, 40 grains; tartrate of potash, 1 drachm; compound spirits of ammonia (salvolatile), one-half drachm; water to one and one-half ounce. Mix.

The attack of gout should be treated as follows: If the pain be severe, and redness of the joint be excessive, a few leeches should be applied to the inflamed surface, but it will not always be necessary to apply them, as hot fomentations or poultices will be sufficient. A small blister raised near the inflamed joint, either by plaster or the "blistering liquid," will sometimes give speedy relief to the pain. When the pill and draught above advised have been taken, and the bowels are thoroughly cleansed, the following medicine may be given: Iodide of potassium, 40 grains; bicarbonate of potash, 2 drachms; colchicum wine, 2 drachms; water to make 8 ounces. Mix. Take two tablespoonfuls three times a day.

If there be want of sleep, compound ipecacuanha powder (Dover's powder) should be given in ten grain doses at bed-time; if the fever be great, antimonial powder (James's powder), combined as follows, will allay it, and relieve pain: Compound ipecacuanha powder, two and one-half grains; antimonial powder, three grains. Mix. Take one every four hours.

Warm baths should be given every day while the attack lasts. At bed-time, a foot-bath of mustard and hot water gives comfort, especially if the feet be afterwards wrapped in cotton-wool, and kept so until the swelling abates.

If the stomach become the seat of the attack, a mustard plaster should be applied on its region, and some narcotic and stimulant given—e. g., tincture of henbane and ammonia. If there be persistent severe headache, a plaster may be placed on the back of the neck, and may ward off more serious symptoms. The diet should be carefully regulated during and after an attack of gout. Stimulating drinks and rich food should be avoided as much as the constitutional power will permit.

The curative treatment of gout, if to be attained at all, must be aimed at during the intervals of the attack. To this end, careful and abstemious living, with exercise in the open air, are important means.

Gravel.—Symptoms.—Pain in voiding urine, sometimes very severe in character, and extending from the loins down the front and inside of the thighs. A small portion of gravel, passing from the bladder, will often cause great difficulty in voiding the urine. A sediment, or small fragment of gravel, may be found deposited in the vessel after a paroxysm.

Treatment.—During the paroxysm of pain, a hot bath will give relief, an opiate being taken at the same time.

After the paroxysm is past, the morbid condition of the urine that gave rise to gravel should be corrected. If the sediment be red, alkaline medicines may be taken. (See List of Medicines.)

Hæmorrhage from the Bladder.—Symptoms.—The occurrence of blood in the urine is readily perceived, and therefore requires no description; but as a symptom it is desirable that its several sources should be pointed out. If there be pains in the loins and a feeling of general illness, and the blood be equally diffused through the urine, or be accompanied with minute worm-like clots, the blood proceeds from the kidneys. Should the stream of urine be at first free from, or only slightly tinged with, blood, and the flow become more and more deeply colored, the inner surface of the bladder is most probably the source of the blood. If blood flows drop by drop without urine, the passage external to the bladder will be its source.

Treatment.—If the blood be believed to come from the kidney, it will probably be the result of inflammation of that organ, or of some injury inflicted on the loins, or from the existence of a calculus or stone in the kidney. In either case absolute rest in bed must be enforced. Leeches, from eight to twelve, should be applied on the loins; or, if practicable, cupping on the same region to the extent of eight or ten ounces will be preferable. The bowels should be freely opened by saline purgatives, such as Epsom salts, Glauber salts, or Rochelle

salts, at the same time, if there be pains in the loins, it may be relieved by five grains of Dover's powder, or extract of henbane, every four hours.

If from the previous condition of the urine—i. e., if it has deposited gravel for some time—it is to be inferred that the bleeding is caused by a stone in the kidney, some alkali should be combined with the sedative, thus: Bicarbonate of potash, 1 drachm; tincture of henbane, one-half ounce; water to 6 ounces. Mix, and give a sixth part every four hours while the pain lasts.

If from the symptoms, before described, the hæmorrhage appears to have occurred in the bladder itself, it will in all probability partake of the character of debility. In such cases the tincture of perchloride of iron or gallic acid or acetate of lead may be tried.

Hæmorrhoids (Piles).—SYMPTOMS.—There are tender and painful swellings of the extremity of the bowels, the inconvenience and troublesome irritation of which are aggravated by walking or riding. They are commonly caused or accompanied by constipation, at the same time the action of the bowels increase their soreness, and often cause them to bleed freely, while the subject of them is at stool. The color of the blood is usually of a bright red.

TREATMENT.—As they originate usually in some defective state of the circulation in the liver and intestines, so they are to be relieved by correcting the state of those organs. This is most surely done, if the piles are of recent appearance, by a light diet, abstinence from stimulants, and the use of enemata of cold water. Simple aperients, such as castor oil, or lenitive electuary, by diminishing fulness of the vessels of the lower bowel, are of great use. Bathing the parts with cold water affords relief. Considerable comfort is derived from the application of ointment of galls or any unirritating ointment, as these diminish the friction and pressure that cause sometimes much distress and discomfort. These latter applications are almost the only palliatives within reach of the non-professional for piles of long standing, and which assume to all intents and purposes the characters of tumors.

Headache.—There are few more distressing complaints than a severe headache, few more puzzling to account for in point of suddenness and intensity and in the rapidity of their disappearance. A "nervous" headache, for instance, comes suddenly upon one, and disables us from our duties, and may perhaps be dispelled, as it were magically, by a cup of tea, or a spoonful of spirits of salvolatile. This, however, is rarely the extent of headache. It is not a disease of itself essentially, but

is the indication of some morbid condition, it may be only temporary, of the brain or of its coverings. As such it is often a persistent symptom, and the source of inexpressible suffering, more especially if it be the result of some structural disease within the brain or skull. There are, therefore, various kinds of headache—the nervous, congestive, neuralgic, rheumatic, bilious, etc.

The nervous headache, arising from various causes of debility, may, as already mentioned, be very short lived, and yields rapidly to stimulants and antispasmodics. Congestive headache is of a character distinct from the preceding, as it does not generally come suddenly, is not amenable to the same treatment, but requires the reverse—viz., purgatives and low diet. This form proceeds from constipation, from over-use and exertion of the brain. Bilious headache, or sick headache, differs very little either in origin or treatment from the preceding and requires similar treatment. Neuralgic and rheumatic headache are so closely allied in their nature that they must be spoken of together in relation to treatment. This kind of headache is prone to assume a periodic form. It is to be relieved by the remedies for rheumatism—e. g., quinine, or iodide of potassium. Neuralgic headache is sometimes also much relieved by the external application of sedatives. The Belladonna liniment of the British Pharmacopœia applied freely over the surface of the forehead, or on the back of the neck, frequently gives great relief. Care must be taken that the skin is entire. It would not do, for instance, to apply any sedative or narcotic if the skin be tender from a blister, or leechbites.

Whooping Cough (Chin Cough).—SYMPTOMS.—A contagious or infectious disease, beginning as a common cold, and, after a few days, when the febrile symptoms have disappeared, showing a spasmodic or paroxysmal character. The cough comes in distinct fits, each of which consists of a series of forcible expirations or cough noises, followed by an inspiration, or hard drawing in of the breath, with a sound almost exactly like the word "whoop," hence the name. The fits are accompanied with great distress to the patient—the face becomes red, the eyes bloodshot, and at times bleeding from the nose and mouth takes place. These fits are terminated generally by vomiting. During an attack, a child will exhibit great fear, and will run to its nurse or mother, to whom it will cling tightly for protection as it were against the cough.

TREATMENT.—For children of two years old and upwards, the following mixture may be given: Tincture of cantharides, 1 drachm; compound tincture of camphor (Paregoric), one and one-half drachms; compound tincture of bark, 3 drachms;

syrup of Tolu, to make 2 ounces. Mix. One teaspoonful to be given three times a day. The chest should be rubbed freely with compound camphor liniment, or oil of turpentine, or Roche's embrocation.

If the cough is very troublesome, and prevents sleep at night, the following will be found useful for children above one year of age: Hydrate of chloral, 24 grains; syrup of orange peel, one-half ounce; water to make 2 ounces. Mix. One teaspoonful to be taken at bedtime. The patient should be confined to one room if the disease comes on during the latter end of autumn, or the beginning of winter, or whenever the weather is cold. If, however, it comes on in the summer, or when the weather is warm, the restriction is less necessary.

Hysteria.—SYMPTOMS.—The following are among common indications of hysteria: Flatulency; the feeling of a lump or ball at the front of the throat, causing a sense of choking; a pain in the left side, just below the ribs, as of something sharp, like a nail, running in; and uncomfortable impulse to laugh or cry without sufficient provocation, this going on until it becomes what is known as an "hysterical fit," in which the patient tosses herself about violently, and, unless protected, would injure herself.

The causes of hysteria are manifold; constitutional peculiarity, irregular menstruation, luxurious living, or want of something to occupy the mind and body, or mental troubles. A condition very similar to hysteria sometimes attacks persons of the male sex; when this is the case, the chances are that the nervous system is in a weakened state, and will, before long, manifest more serious signs of its condition.

TREATMENT.—No other disease is more obstinate or more difficult to treat than hysteria. The general health should be looked to in the first instance. The following medicine, taken regularly, may have considerable influence over the symptoms: Compound tincture of valerian, one-half ounce; fœtid spirits of ammonia, 2 drachms; spirits of nitrous ether (sweet spirits of nitre), one-half ounce; water, to make 8 ounces. Mix. Two tablespoonfuls to be taken three times a day. An attack of hysterical fit cannot be better treated than by a liberal application of cold water to the face and chest. The water should be applied in large quantities, and should be dashed from a height on the patient. The various antispasmodic medicines, such as ammonia, valerian, assafœtida, camphor, are all useful for hysteria. They exert still more power if combined with tonics, such as steel, quinine, zinc, etc. (See List of Medicines.)

Incontinence of Urine occurs most commonly in young children, partly from the effects of habit, partly from the

effects of muscular weakness or spasm of the bladder. When it is met with in elder persons it is doubtless a symptom of some disease of, or injury to, the bladder.

TREATMENT.—When it can be traced to spasm, sedatives are useful; when, however, as is more frequently the case, it is the result of weakness of the muscular fibres of the bladder, the following should be tried: Tincture of perchloride of iron, 10 minims; water, 1 ounce. Mix. To be given twice a day. This dose is for a child of five years and upwards; for a younger child half the quantities will suffice.

Indigestion (Dyspepsia).—SYMPTOMS.—Various kinds of pains in the region of the stomach, which occur soon after meals. These pains are also sometimes felt between the shoulders and in the back, flatulency causing some distention of the bowels; pain that is called "heartburn," nausea, and sometimes vomiting, headache, disturbed sleep, palpitation of the heart, and other sympathetic inconveniences also occur. Among the chief causes of this disorder of the stomach is the abuse of stimulating liquors, or of narcotics, such as tobacco and opium, the use of too highly seasoned or rich food, sedentary habits, and want of proper exercise. Mere weakness of the system, in which the stomach will partake, is often a cause of indigestion.

TREATMENT.—The main object in the treatment of indigestion is to find out what is the cause of the disorder. This being done, care should be taken to avoid those causes, as above named. Urgent symptoms, such as acrid eructations, heartburn, flatulency, and pain, may be relieved by bicarbonate of soda or potash, or by carbonate of magnesia, e. g.: Bicarbonate of soda, 120 grains; tincture of rhubarb, 3 drachms; peppermint water, 3 ounces; infusion of gentian, to make 6 ounces. Mix. One tablespoonful after every meal; or two tablespoonfuls morning and evening will probably prove curative. If not, the mineral acids should be tried, taken with bitters, such as gentian or calumbia. (See List of Medicines.) The diet should consist of light and easily-digested substances. Care should be taken to avoid those articles which experience has shown the sufferers to be excitants of indigestion.

Infantile Remittent Fever.—(Low fever of children, worm fever). A non-infectious fever, generally due to some irritation in the stomach or intestines.

SYMPTOMS.—The symptoms of this fever come generally at night, passing off in the morning. They are, shivering, heat of skin, thirst, furred tongue, frequent pulse, sometimes pain and tenderness of the abdomen, sickness. The sleep is dis-

turbed by starting and moaning, the little patient is fretful and restless. Superadded to these, is a short, dry, hacking cough. The bowels are out of order, the appetite at times is good, at others fails altogether, the urine is scanty and high colored. The symptoms vary greatly in different cases; at times the brain seems to be affected, and there may be convulsions; this form is, of course, dangerous. In other cases there is profuse diarrhœa, and, in some, inflammation of the bowels, or lungs, occurs. This fever has been called "worm fever," from a mistaken idea that it is always caused by worms. Though undoubtedly intestinal worms may accompany the other symptoms, they are far from being its cause. Teething is much more frequently a cause; bad feeding, or over-feeding, excessive cold, may one and all produce the disease.

Treatment.—Having removed all causes of irritation from the stomach and bowels, by means of castor oil, or a dose of syrup of senna, the patient should be placed on a light diet. As long as vomiting or diarrhœa continues, milk or milk gruel, or arrowroot, or both, should be given; if there be no diarrhœa, rice milk, bread pudding, and jellies may be given in addition to the above; no animal food should be allowed. In young infants, a still stricter diet is required, as the stomach is often very irritable, and will not bear the lightest farniaceous food. In such cases a tablespoonful of cream or new milk should be given every hour or hour and a half. A warm bath should be given for a few nights, and the patient should be kept in bed during the commencement of the illness and its acute periods. The thirst should be met with small pieces of ice or cold water.

The following powder will be found useful to regulate the bowels, if they are disordered, if given at bed-time occasionally: Mercury, with chalk, 3 grains; powdered rhubarb, 5 grains; bicarbonate of soda, 2 grains. The following medicine may be taken when the fever is acute, the doses being apportioned according to age: Powdered nitre, 3 grains; ipecacuanha wine, 2 drachms; syrup, 3 drachms; water to make one and a half ounces. Take one teaspoonful three times a day. As signs of amendment begin to appear, quinine wine, or steel wine with quinine should be given.

Inflammation.—Symptoms.—Inflammation, while it is certainly the commonest form of disease, and the most frequent cause of both functional and structural maladies, is at the same time a condition much more frequently assumed than ascertained. There exists a common apprehension that any internal pain, especially if it be attended with functional derangement, proceeds from inflammation of some internal organ. It is important that this misapprehension should be corrected if

possible, inasmuch as the treatment must differ widely, accordingly as inflammation is present, or mere congestion, or neuralgic pain.

Treatment of Inflammation and its Results.—The general principles of the treatment consist in—1st, moderating the force of the circulation; 2nd, in reducing the temperature, and causing contraction of the loaded small vessels; and, 3rd, in removing the effects of inflammation. The first indication is effected by depletion, or by medicines which affect the force of the heart's action. Depletion is effected by bleeding from a vein, by cupping and by leeching. The last of these is the only means of depletion that can be employed by a non-professional person; and is, indeed, almost the only means that is adopted even by professional persons. Venesection, or bleeding from the arm, is now so nearly exploded that there are medical men who have been many years in practice, who have never performed this operation. Even leeching is seldom required. The occasions under which they may be advisable will be found under the instructions for the treatment of respective diseases. (See also Leeching.) With the view of moderating the force of the circulation, the employment of the warm bath will be found serviceable, although it would seem that during the bath the pulse may at first be quickened, faintness may be induced by its prolonged use. Short of this, however, the profuse perspiration that often follows its use reduces both the rate of the pulse and the temperature of the surface.

The next means for fulfilling this indication will be found in lowering medicines—such as tartar-emetic, ipecacuanha, calomel, and various purgatives. An important means also to the same end will be the relief of pain by the use of henbane, etc. The second indication in the general treatment of inflammation, viz., the reduction of the temperature and contraction of the loaded vessels, will, in a great measure, follow on the successful employment of the means above named for the first indication. These will be aided by local application of cold, either by evaporating lotions, or by the use of ice, or by the astringent action of certain medicines applied externally, such as nitrate of silver, extract of lead, tannin, etc. If the inflammation be seated in an internal organ, blistering and external irritants are serviceable. The last indication, viz., the removal of the effects of inflammation, such as thickening of parts by deposition of material into their structure, is to be fulfilled by the use of stimulants, internal and external, and by tonic medicines, aided by a full diet.

Inflammation of the Brain, or Brain Fever.—Symptoms.—This affection, which is also known as water on the brain, or

Hydrocephalus, is of two forms, acute, and chronic. In the acute form, symptoms will vary with age.

In Children.—In infants, the first symptoms that will be noticed will probably be simple restlessness or fretfulness. The head will become hot, and there may be sickness, which will soon become a predominant symptom. The bowels are for the most part relaxed; the flow of urine notably diminished. If old enough to express its feelings, the child will complain of pain in the head; if too young for that, the same will be indicated by its constantly putting its hand to its head, and rolling its head about. An early symptom is the bending of the thumb inwards on the palm of the hand, and downward flexion of the toes. The eye will be bloodshot, and the brows knitted. The sleep of the child is disturbed with starts, or it will wake up as if alarmed. In young infants, the soft part on the top of the head will be full and throbbing. These symptoms are followed in fatal cases by a bending backward of the neck, with convulsions and stupor. It will be seen also that one side of the body is more convulsed than the other, which may be paralyzed. This disease may last for several weeks; during this time the child is constantly uttering a peculiar sharp cry, or moaning, or screaming.

In Adults.—In the adult, the symptoms of inflammation of the brain constitute what is generally called "brain fever;" in which there is a great mental excitement giving rise to delirium. The senses become morbidly acute, so that the ordinary amount of light is not bearable, and noise of any kind is intolerable. The inflammation is attended with great pain in the head, hot skin, and fever. The eyes are bright and bloodshot, the pupils readily contract. The bowels are costive, the urine scanty and high colored. If the disease do not yield to treatment, twitching of the limbs, convulsions, collapse and stupor precede death.

The chronic form is seen exclusively in children, and is often born with them. Its predominant sign in that case is the enlargement of the head, and retarded development of the mental powers, or their premature development. The body is badly nourished, and the digestive functions are disordered.

Treatment of Acute Inflammation of the Brain.—In infants, difficult dentition is one of the exciting causes, the condition of the gums therefore should be looked to in the outset of the symptoms, and, if full and swollen, should be freely lanced, as the pressure of the gum upon the growing teeth and their nerves keeps up irritation of the nervous centres. This operation is simple enough, and requires only one precaution—viz., to cut parallel with the edge of the jaw, toward

the front of the gums. The incision should be made downward until it comes in contact with the tooth. If it be made behind the middle lines of the gums, there is a risk of cutting through the sac of the second set, which are being developed behind the first. The operation is better performed with a proper-shaped gum-lancet, but as this instrument is not often in the hands of the non-professional, a sharp pen-knife will serve the purpose. The child's head should be steadily held between the operator's knees, while its hands are held by some one else.

Cold applications, such as spirit lotions—e. g., one part of gin to ten of water, should be kept constantly applied on a rag; or ice-cold water may be used.

If the symptoms be very acute, two or three leeches may be applied on the bony prominence behind the ears, as pressure can efficiently be made there to stop the bleeding as soon as they come off.

Calomel should be given in repeated small doses, unless it produces diarrhœa; it should be then changed to grey powder, with a little powdered nitre. Thus: Calomel, 2 grains; nitre, 6 grains; white sugar, 6 grains. Mix, and divide into six powders. Give one every four or six hours. Or, take of grey powder, 6 grains; nitre, 12 grains; white sugar, 6 grains. Mix, and divide into six powders. Give one every six hours. The diet should be of the lightest kind, consisting mainly of milk and water. A hot bath should be given at least once a day; and the body of the infant may with great advantage be sponged over with warm vinegar and water, equal parts.

If, in about eight-and-forty hours after the adoption of the above means, the symptoms do not abate, a blister-plaster should be applied to the nap of the neck. This, in case of infants, should not be allowed to remain on longer than two hours. It should then be taken off, even if it has not raised a blister. A muslin bag filled with bread and water poultice should be applied to the surface, where the plaster has been; the skin will then shortly begin to blister. The poultice should be repeated every four hours, or when it becomes cold.

In most cases the preceding means will have succeeded in subduing the malady; if, however, as is very frequently the case, there is a scrofulous constitution, the remedies will not have so favorable an effect. The symptoms may continue for many days in a milder degree, and the little patient will then require the withdrawal of all mercurial medicines and the substitution of a fuller diet for the milk. Beef-tea may then be given several times a day, and if the sickness and diarrhœa should continue, small doses of brandy (from ten to twenty or thirty drops, according to age) may be given every three or four hours.

Mouth, Inflammation of.—SYMPTOMS.—Pain in moving the tongue, and sometimes in moving the cheeks, the insides of which are swollen and red; the gums and the tongue also are often much swollen. There appear numerous white patches, which are in reality superficial ulcers, covered with a white false membrane. The tongue is cracked, and scored with a whitish-brown fur, the breath is very offensive, and there is general feverish disturbance, with irregularity of the bowels, and sometimes extreme prostration. This affection may almost invariably be traced to the injurious influence of sewage air.

TREATMENT.—The first thing therefore to be done is, if possible, to remove the patient to a purer atmosphere. If the bowels be confined, some mild aperient should be given, such as castor oil; or, in the case of a child or infant, the carbonate of magnesia. The following medicine should be given three times a day: Chlorate of potash, 80 grains; water, 4 ounces. A tablespoonful for a dose for an adult, a teaspoonful for a child. In the latter case some sugar may be added for the sake of flavoring it. The following lotion will also be found useful: Chlorate of potash, 40 grains; water, 4 ounces. The mouth being repeatedly washed with it. For children it will be as well to add a little honey, or for infants it will often suffice to smear borax and honey upon the tongue, whence it will be unconsciously applied in the mouth. With adults, some tonic will promote convalescence when the acute soreness has subsided.

Itch.—SYMPTOMS.—An eruption of small pimples, which excite intense itching. They occur most frequently, to begin with, between the fingers, and on the backs of the hands. After a few days, the pimples may also be detected in the bends of the joints—e. g., on the wrist, on the feet, and it may even spread all over the body. The itching is constant, though it is worse at night, when warm in bed, and after violent exercise. If the disease be neglected, and if cleanliness be not sufficiently attended to, the spots become inflamed and fill with matter.

This disease is caused by a minute microscopical insect, called the "Acarus scabies," which burrows beneath the skin.

TREATMENT.—The following lotion should be applied: Quicklime, 1 ounce; sulphur, 4 ounces; water, 1 pint (imperial measure). These should be boiled together slowly for about four hours, and then allowed to stand till the clear yellow fluid can be poured off. Water should be added to this to make the quantity up to two pints.

The mnner of applying this lotion is to wash the affected part with warm water, and then to apply the lotion for half an

hour. After twelve hours, the body should be well washed with soap and water, and the skin carefully examined, to see if any spot remain unacted upon by the lotion. Its sufficient action must be judged by the aspect of the vesicles or pimples, those on which it has taken effect will present an opaque yellow white head. This application, well applied once, will generally be found efficient, but it may require a second, and even a third, application. If the pimples be inflamed, and have heads filled with matter, or be ulcerated, the lotion will aggravate them and give pain. Under these circumstances, it must either be considerably diluted with water, or the common sulphur ointment may be substituted for it. When the ointment is applied, it should be allowed to remain on the skin for two or three days, fresh quantities being applied if it is rubbed off. After the second or third day, the whole skin should be well washed with soft soap and water.

Measles.—This is an infectious, eruptive fever, having an incubative period of about fourteen days, commencing with marked catarrhal symptoms, and belonging more especially to the ages of infancy and childhood. The little patient appears to have a severe cold; he has sneezing and running at the nose, "watering at the eyes," and a short, hard cough. This condition, in the course or a day or two, or it may be in a few hours, becomes one of a distinct febrile state. A general heat of the skin comes on, the pulse is quickened, and on the third or fourth day, on the face, chest and body a mottled rash begins to show itself. The rash consists of distinct spots slightly raised above the surface of the skin, and clustered in groups, often having an indistinctly crescentic arrangement. It begins to disappear again in about three or four days, and is usually all gone by the end of a week.

TREATMENT.—The catarrhal symptoms which usher in the measles require only the simplest treatment of nursing, warm baths, and low diet. When the eruption appears and makes it clear that the case is one of measles, the same plan of treatment is still applicable. There is a very large proportion of cases of measles that are in themselves so slight that they really amount to little more than an attack of common cold, and require no other treatment. If, however, there be fever, rather more severe, with a troublesome dry cough (which is very commonly an attendant), a simple saline mixture, as follows, will be found of service: Powdered nitre, 1-2 drachm; ipecacuanha, 1 drachm; paregoric, 1-2 drachm; water (sweetened with sugar), 2 ounces. Mix. A teaspoonful to be given every four hours, to an infant about two or three years of age; the doses for older children should be increased, on the scale given in the list of medicines. For an infant under one year old it may

be as well to omit paregoric. If there be constipation of the bowels, some simple aperient should be administered, such as castor oil or grey powder. The body should be sponged over every day with warm vinegar and water.

Should the eruption suddenly disappear, and difficulty of breathing or other symptoms of congestion of the lungs, as shown by duskiness of the skin and coldness of the surface, come on, a hot bath, with mustard in it, should be had. At the same time stimulants, such as compound spirits of ammonia, wine, or brandy should be administered—e. g., for an adult, a drachm of spirits of salvolatile in a wine-glass of water, every two or three hours. Wine, to the extent of four ounces in six hours, may be given; or brandy in proportion, allowing for its greater strength.

Measles in Adults.—When the disease occurs in adults it is usually more severe, and calls for more active treatment. The doses prescribed above should be augmented on the scale given in the list of medicines. There is a popular notion that measles leave behind them something that requires clearing away, and acting thereupon it is not uncommonly the case that the unfortunate child is actively physicked for a few days. The whole proceeding is based on error. When the child is well, better let well alone.

Milk Fever.—Symptoms.—A light form of puerperal fever is that which is commonly known as "milk fever." This is simply a passing febrile condition attending the establishment of the secretion of the milk, if not drawn off freely enough, when the breasts sometimes become painfully distended, and the fever is rather smart for a few days, and then rapidly subsides, with simple aperient salines and abstinence as far as may be from fluids, taking care that the breast is emptied as thoroughly and frequently as possible.

Miscarriage, or Abortion.—Symptoms.—It occurs very often without any warning, but commonly it is preceded by slight pains in the back and abdomen, and by a slightly colored discharge. These symptoms occurring in the early months or weeks of pregnancy, are sometimes mistaken for the return of the ordinary period, which may have been supposed to have been suppressed from some other cause. These warnings may end as such, or the abortion becomes completed by the sudden expulsion of the contents of the womb, attended with more or less hæmorrhage. In some cases considerable hæmorrhage will continue for several days before miscarriage is complete.

Treatment.—Rest, with the administration of opiates to allay pain. If the hæmorrhage be profuse, napkins wetted with

cold water, or cold vinegar and water, should be applied to the lower parts of the body. The patient should be kept as cool as the season will admit, and some mild aperient should be given, if the bowels have been costive. A light diet should be taken. The following pill should also be given every four hours, if the bleeding continue: Acetate of lead, 2 grains; opium, 1-4 grain; conserve, or moist bread crumb, enough to make a pill. Prevention is an important point in these cases, as when the accident has happened once, it is very prone to recur at the same period of future pregnancies. The third month is a very usual period for abortion to occur.

Nervous Shock.—On the occurrence of a severe accident, such as a fracture of a limb, or a fall from a height, the sufferer is generally found pale, fainting, and perhaps half unconscious, with a small and irregular pulse. This condition of shock to the system may go into a state of collapse from which the patient may never recover. Under such circumstances, however, what is termed "reaction" takes place, attended either with complete recovery in a few minutes, or the complete reaction may be prolonged for a day or two.

TREATMENT.—First and foremost, see that the patient has a good supply of fresh air; let him be placed in the recumbent posture, with the head on a line with the body. Small quantities of stimulants should be given, such as about a tablespoonful of brandy in a wine-glass of water, or a teaspoonful of compound spirits of ammonia (spirits of salvolatile) should be given in a wine-glass of water. Warmth should be secured to the surface of the body by blankets and h[illegible] bottles to the feet and legs.

Paralysis.—SYMPTOMS.—After the immediate symptoms of an attack of apoplexy have passed away, more permanent effects are often left in the form of palsy of some of the muscles, or of insensibility of parts of the surface of the body. The body may be palsied vertically, that is, one-half of the body from head to foot, may have lost its sensibility to external impressions, or the muscles on the side of the body may have lost their power of moving the limbs. When the right side of the body is paralyzed, there is very often a defect in the power of speech, by which the patient uses wrong words to express his ideas. Or, the palsy may effect the body transversely, the trunk and limbs below a certain line having lost their power. Another more restricted loss of power may occur, as local paralysis. Thus, one hand, or one foot, may be palsied, or the muscles of one side of the face alone may suffer; or, again, the tongue and palate, etc., may have lost their free movement without impairment of the muscular power of other parts of the body.

TREATMENT.—If the case come under treatment soon after the attack of apoplexy, the symptoms more readily yield to treatment; but the result too commonly is that some degree of paralytic impairment is commonly left behind. In the early phases of this affection, the careful administration of small doses of mercurials—e. g., two grains of blue pill, night and morning, continued for a week or ten days, unless it produce tenderness of the gums and flow of saliva, when it should immediately be stopped. This effect should be carefully watched against day after day. The effects of the mercurial will be assisted by some form of counter irritation, such as blistering the nape of the neck, and keeping the blister open by dressing it with savine ointment, or by rubbing the following ointment on the nape of the neck, night and morning, until an eruption of pimples appears: Tartar emetic, 1 drachm; lard, or spermaceti ointment, 1 ounce. Mix.

After the mercurial has been discontinued, tonic medicines will be found of service, such as steel, quinine, and cod-liver oil.

Pregnancy.—SIGNS OF.—It is sometimes a difficult matter to determine the fact of pregnancy. There is, however, strong ground for belief in its existence, if under possible conditions menstruation becomes suspended in a healthy woman, previously regular in her periods. If to this sign be added, after about four or five weeks, the occurrence of morning sickness, with enlargement of the breasts and development of the glands around the nipple, which begins to be encircled by an areola of darkening skin, the suspicion becomes strengthened, and, generally speaking, time confirms it.

MANAGEMENT OF.—Of the management of the period of pregnancy there is not much to be said, as each woman may act according to her ordinary mode of life and circumstances when in good health.

THE DISORDERS of pregnancy will, however, require notice as to their prevention as well as treatment. The stomach being, through sympathetic irritation, prone to derangement, care should be taken to avoid what is known by individual experience to be indigestible, avoiding the frequent recourse to stimulants to relieve the slight ailments incidental to a natural condition. Indigestion is one of these, and may generally be relieved by bicarbonate of soda or magnesia, or by a rigidly abstemious diet for a few days. Costiveness is also a common attendant upon pregnancy, and leads to a troublesome affection —piles, and should be prevented by dieting, or by occasional doses of some mild aperient, such as castor oil, or rhubarb and magnesia, or citrate of magnesia. Piles, if present, will also

be relieved by the action of the aperients. We would warn against the senseless practice of taking frequent doses of oil as a matter of course. There is no call in nature for anything of the kind, and no need for such gratuitous physicking.

Vomiting.—The morning sickness that attends the early weeks of pregnancy amounts in general to little beyond annoyance every morning. Sometimes, however, it becomes so constant and persistent as to be a real illness of itself, preventing the retention of food of any kind, so that the sufferer becomes enfeebled, emaciated, and as if bloodless. The ordinary morning sickness may be moderated by a teaspoonful or two of Noyau, or cherry-brandy in milk, taken quite early in the morning before rising. It should be swallowed, the patient merely turning on her side and raising only on to her elbow—not getting up into the upright or sitting posture. Then lying quietly for an hour, and taking after that time a small cup of strong coffee and dry biscuit; again resting for half an hour after this breakfast.

Quickening is very frequently attended with faintness and palpitation of the heart, but these soon pass away, and are relieved by simple means. These symptoms, however, are apt to recur at any period, under circumstances that disturb health, such as over-fatigue, either in pursuit of pleasure or of duty.

Enlargement and distension of the veins of the legs are apt to occur during the latter months of pregnancy, when the womb, being large and heavy, presses upon the veins in the lower part of the body, and retards the return of the blood from the limbs. Hence, varicose veins are established, and become a fixed trouble. The recumbent posture, by taking off some of the pressure from the internal vessels, is calculated to diminish the distention of the veins of the legs; additional support may be afforded to these by wearing elastic-web stockings.

Cutaneous Irritation of the private parts often occurs in the early months of pregnancy, and, indeed, in some persons forms the first indication of the pregnant condition. A lotion of carbolic acid applied to the parts several times a day affords considerable comfort. Take of goulard water, one-half pint; saturated solution of carbolic acid, 10 drops. Mix and use as lotion.

Irritability of the Bladder, giving occasion for constant calls to micturition, is another excessively troublesome affection that often attends pregnancy, especially during the later weeks. The following mixture will be found useful: Muriated tincture of iron, 1 drachm; tincture of henbane, one-half ounce; water to 6 ounces. Mix. Take a sixth part every four or six hours.

Protrusion of the Navel.—This frequently occurs in the early weeks of infantile life.

TREATMENT.—The best method of treating it is to cut a piece of cork or ivory, in the form of a half sphere, and place the rounded side on the protruded navel. Adhesive plaster should then be used to retain it in its place. It is generally necessary to pursue this treatment for some months, particularly in female children. The plaster should be changed every morning, and the skin washed before the cork is replaced.

PUERPERAL FEVERS.—SYMPTOMS.—When a labor has been protracted, a degree of fever sometimes occurs and passes off in the course of a few days. This passing febrile state is, however, very different from the condition commonly known as "puerperal," or "child-fever," which does not make its appearance generally until several days, and is indeed a very grave malady. It is ushered in by indefinite symptoms referable to the nervous system, such as headache and sleeplessness. If night after night passes in disturbed sleep, with or without dreams of a distressing character, and restless indefinite discomfort by day, suspicion should be aroused, and attention drawn to the probable approach of fever. After this indefinite illness has lasted for seven or eight days, it will be found that there is a degree of tenderness on pressure at the lower part of the abdomen, with some pain in moving or on taking a long breath. There will also be a degree of flatulent distention of the bowels. The ordinary discharge will have diminished, as will also the secretion of milk. Shivering will occur alternately with flushing and heat of surface, as detectable by the thermometer. The pulse becomes rapid, but wanting in force.

TREATMENT.—While the symptoms are mild, a few doses of Dover's powder, with mild saline aperient and careful dieting, will generally suffice to insure their disappearance. If there be pain in the abdomen, hot fomentation or turpentine stupes will give relief. Should these simple means prove ineffective, and the symptoms become aggravated, with increase of pain, reliance may be placed in small repeated doses of opium, either as Dover's powder or in form of pill,—e. g., Dover's powder, 5 grains every six hours; opium, in form of pill, half a grain every six hours; turpentine stupes repeated every morning and night. If the bowels should be confined, a dose of castor oil or a rhubarb draught should be given. In most cases this treatment will suffice, with a light nutritious diet. In those cases, however, in which there is a feeling of sinking and prostration, stimulants may be cautiously given. Should there be sickness or vomiting, champagne may be taken, or small and frequent doses of soda-water and brandy.

This form of fever will sometimes last two or three weeks, and requires the greatest care in nursing, and in diet, etc., during convalescence.

Purpura.—(THE PURPLES.)—SYMPTOMS.—Patches or spots of a purple color, resembling bruises, their colors also going through the various shades shown in bruises. They are sometimes accompanied by a tendency to bleeding at the nose. There may be some febrile disturbance, but usually the general health shows no sign of derangement.

TREATMENT.—Tonics are required in this disorder. The muriated tincture of iron, with the addition of quinine, forms a very useful medicine. If the bowels be confined, sulphate of magnesia should also be added. For children, steel wine will generally be sufficient, together with a careful nutritious diet of beef tea, meat, etc.

Remittent Fever.—ENDEMIC FEVER.—This fever is not infectious, and it differs from ague in there being no distinct intermissions, but frequently recurring attacks, generally taking place in the morning.

SYMPTOMS.—The face is flushed, there is headache, and occasionally delirium; there is great tenderness in the stomach, accompanied with vomiting of a bilious nature; the bowels are confined, and the urine is scanty. If the bowels are relieved, the motions are of a dark, greenish color, and very offensive. The skin is hot, the pulse rapid, the tongue has a brownish fur. The fever becomes less as the skin becomes moist, and as the patient goes into a sweat, the remission occurs. The remission generally lasts from one to three hours, when the fever again comes on, and gradually increases in severity till it attains the intensity of the former attack, and perhaps exceeds it. During the remissions of the attacks, the patient remains in a state of mild fever, accompanied by giddiness or lassitude. The fever may last from five days to five weeks. A patient may be said to have the fever in a favorable manner as the remissions are more distinct.

TREATMENT.—If the bowels are constipated, the following aperient mixture should be taken: Epsom salts, one-half ounce; tincture of rhubarb, 1 drachm; water to make one and a half ounces. Mix. When the remissions have clearly set in, the patient should take the following draught three times a day: Sulphate of quinine, 3 grains; syrup of orange peel, 1 drachm; dilute sulphuric acid, 10 minims; water, 1 ounce. Mix. Quinine is not only of value as a curative agent in the endemic fever, but it is also a preventive. Travelers in the low and marshy districts of tropical climates do well to take two or three grains of quinine every morning.

Rheumatism—Is an inflammation or febrile affection that attacks the joints and muscles, or their coverings and sheaths, in various parts of the body. When the large joints are the seat of the disease, in its most active form, it is known as rheumatic fever, on account of the feverish condition that accompanies it. It is often, however, met with in a less active form, as subacute, chronic, or neuralgic rheumatism.

General Symptoms.—In the acute form the pain in the joints is so acute, and they are so sensitive to the slightest movement, that the patient dreads even a shaking of the bed he lies on. The joints are swollen, and red as well as painful. A high degree of fever attends the inflammatory affection of the joints; the pulse is full, strong and fast; the tongue is furred; the bowels generally costive; the urine scanty and high colored. The seat of the inflammation is rapidly changed from one joint to another, the pain subsiding to return perhaps as severely as before.

Subacute Rheumatism.—In this form the pain is less severe, and there is a slighter amount of fever. It affects more the muscles than the joints. Of this kind are "lumbago," "rheumatic headache," etc.

Rheumatic Affection of the Heart.—In the acute form, or "rheumatic fever," the coverings and interior of the heart are prone to become inflamed. The occurrence of this complication may be inferred if pain be felt in the region of the heart, attended with palpitation and difficulty of breathing.

Treatment.—The several joints as they are affected should be wrapped round in cotton-wool, covered with gutta-percha tissue or oil-silk, the joint being previously gently rubbed with belladonna liniment. When the pain and inflammation first come on, the patient should, at b time, take the following powder: Calomel, 2 grains; Dover's powder, 10 grains. Mix. Next morning the patient should take the following draught: Infusion of senna, 2 ounces; tartrate of potash, 2 drachms; compound spirits of ammonia (salvolatile), one-half drachm. After the bowels have been freely open, the following medicine should be commenced: Bicarbonate of potash, 2 drachms; water, 6 ounces. Mix. Two tablespoonfuls to be taken, either alone or effervescing, with a tablespoonful of lemon juice, three times a day. The addition of ten minims of colchicum wine sometimes aids the effects of this mixture, but it is apt to produce sickness and purging.

If there is great pain and want of sleep, or if the bowels are open too much, a grain of opium, or twenty minims of laudanum should be taken every night. The above alkaline mixture should not be continued too long, as it is apt to cause irrita-

tion of the intestines. As soon as the pain begins to subside, and the urine to assume its usual appearance, it should be stopped, and the following medicine substituted: Sulphate of quinine, 16 grains; dilute sulphuric acid, 1 drachm; water, 8 ounces. Mix. Two tablespoonfuls three times a day. If there be reason to suspect that the coverings of the heart are affected, a blister should be applied on the front of the chest, over the seat of the heart.

A low diet of milk, arrowroot, rice or sage, or beef tea, should be continued throughout the acute stage, with a change to a more liberal diet as the symptoms subside.

Chronic Rheumatism.—Symptoms.—The pain of this form of rheumatism is less acute, and is more frequently situated in the muscles or their tendons than in the joints. The parts affected become stiff and painful on movement. There is not often much swelling or inflammation of the joints —except of the small joints, as of the fingers—after the disease has lasted long.

Treatment.—The parts affected should be rubbed with a mixture of equal parts of belladonna and soap liniment, or with compound camphor liniment (see External Applications), and if the pain and inflammation be very acute, as sometimes they are, turpentine fomentations should be applied.

The following medicine should be taken: Iodide of potassium, 40 grains; bicarbonate of potash, 2 drachms; water to make 8 ounces. Mix. Two tablespoonfuls three times a day.

Sciatica.—It sometimes attacks the leg, beginning at the upper part of the back of the thigh, and extending downwards to the foot. The pain of this form of rheumatism is very acute, and it is by far the most troublesome to treat.

Treatment.—The application of strong stimulating liniments over the seat of the pain. If the pain be severe, it may sometimes be allayed with half-grain doses of opium every six hours. Iodide of potassium and tincture of bark should also be given. (See Medicines.)

Scarlatina. Scarlet Fever.—Symptoms.—This is a highly infectious eruptive fever, common to all ages, which makes its appearance sometimes almost suddenly, but generally after a day or two of general indisposition, in which vomiting almost always occurs. The rash consists of minute scarlet spots, which are scattered over the entire body. They are not raised above the surface of the skin, over which a diffuse redness commonly prevails. The characteristic appearance is presented by the tongue, which is of a bright scarlet color round the edges, the middle being furred with the papillæ of a bright

scarlet color, standing out, and giving it the appearance of a strawberry. The throat is sore and scarlet, with difficulty in swallowing. On examining the throat it will be found that the tonsils are often swollen and ulcerated. The glands in the neck are swollen also. The pulse is rapid and small. There is great thirst, with entire loss of appetite for food. The rash lasts from five to seven days, when it gradually fades away. The skin, after a variable period, begins to peel off as fine dust or scales; sometimes large flakes come off. The entire skin of the fingers or toes sometimes comes off in one piece like the finger of a glove. The itching caused by the eruption is sometimes a source of great irritation and sleeplessness. In the active febrile stage of the disease it often happens that delirium occurs during night, which subsides with the fever.

Treatment.—A hot bath should be given night and morning, so as to promote the functions of the skin and bring the rash out fully. This is an important point, as when the rash is not out plenteously, the specific poison of the disease has a tendency to affect internal organs, the brain especially. The bowels should be kept open by means of saline aperients. The following mixture is useful during eruptions: Carbonate of ammonia, 40 grains; simple syrup, 1 ounce; water to make 8 ounces. Two tablespoonfuls to be taken three times a day, one tablespoonful by children less than ten years of age, and less for infants; but it is not easy to get young children to swallow medicine or food, in consequence of the soreness of the throat. If the throat be ulcerated, small blisters should be applied outside, on the neck, under the angles of the lower jaw bone. (See Blistering). The throat and tonsils should be painted inside with the following: Nitrate of silver, 20 grains; dissolved in distilled water, 1 ounce. The best way of painting or mopping this on the throat, is to tie a small piece of sponge very tightly on the end of a piece of whalebone, taking care to touch the tonsils at each application. The diet should be light. Free ventilation is an essential point in the treatment of scarlet fever. It must be secured so as not to expose the patient to sudden cold or chill. Disinfection should be carefully attended to.

Scarlet fever sometimes assumes a malignant form. From the very beginning there is a depression of nervous power, the eruption is dusky, and the ulceration of the throat very acute. In this case, stimulants must be given, as wine or brandy and water; but in other forms of the disease, these are seldom needed.

Small-pox. Variola.—Character.—This is an infectious eruptive fever, having, in its natural form, a definite course from the moment of infection to its termination. We shall in

the first place describe the disease as unmodified, in which its course is divisible into the several phases, or stages, of incubation, invasion, eruption, decline.

Incubation.—The stage of incubation, or period during which the disease is being developed in the system, covers a lapse of twelve days from the date of infection, and passes usually without any manifest sign of disease.

Invasion.—At the end of twelve days, the symptoms of invasion make their appearance in indefinite febrile illness, principally marked by pain in the back, and at the pit of the stomach. These premonitory symptoms last for forty-eight hours, and vary greatly in degrees of severity—some cases assuming the character of very severe illness, the exact nature of which is not clear. The use of the clinical thermometer will here be found a help in diagnosis. If the temperature of the body be as high as 100 degrees, or above that, there will be no room for doubt that a fever is impending. Other circumstances, such as possibility of infection, etc., will further assist in arriving at an opinion. The severity of the premonitory symptoms has usually a direct relation to the severity of the subsequent eruptive fever.

Stage of Eruption.—The premonitory illness having existed for forty-eight hours, begins to decline simultaneously with the outbreak of the eruption, in the shape of minute, red pimples, which feel like millet-seeds beneath the skin. They appear first on the upper parts of the body, and last on the legs and feet. In from twenty to thirty hours the eruption is nearly as fully out as it will be.

Varieties.—The number and character of the pimples give rise to varieties, which have been recognized and designated as: 1. Distinct, or discrete; the spots not being very numerous, and clear spaces of skin being left among them. The fever is slight in these cases. 2. Confluent: in many cases the eruption is more copious, the pimples running together and forming large clusters. In this form the fever runs high, and the danger is greater in proportion to the number of pustules. There may be an intermediate variety. 3. The semi-confluent, in which the clusters occur in patches, leaving other portions of skin free from the eruption. The febrile symptoms are neither so mild, nor so severe, as in the above varieties.

Types.—Any one or all of these varieties of the disease may run through their course, ending in perfect recovery; or the symptoms may be characterized by extreme severity or prostration from the beginning. This is the "malignant" type of the disease, the others are the "mild" or "benignant."

Course of the Eruption.—In the ordinary course of the disease, the pimples are red and inflamed by the end of the second day; after this, they gradually begin to show a conical apex, filled with a colorless fluid, and, by the fifth day, they present a small vesicle of this fluid with flattened instead of a conical top. The vesicles from this date alter in appearance, and become pustules, being filled with matter which is "mature" by the eighth day. In this state of the eruption the surrounding skin is red and swollen, and it is at this point that the eyelids swell considerably from the looseness of their texture. The patient is then commonly spoken of as being blind, but in truth he is only blinded for a time. Some pimples appear also in the mouth, and throat, in most cases causing hoarseness and cough.

Stage of Decline.—After the maturation of the pustules on the eighth day, up to the eleventh day, the pustules begin to dry up and form scabs. This scabbing process, however, does not proceed equally over the body, and may last for several weeks on the extremities. It is accompanied by a return of febrile symptoms, often rather severe, and attended with excitement of the brain. This has been termed the "secondary fever." It generally begins to subside after the eleventh day, which has been regarded by some observers as a "critical day." Pitting is pretty sure to follow on unprotected or natural small-pox. Such is the ordinary course of natural small-pox, in its non-malignant form.

Modified Small-pox.—If the subject of small-pox has been vaccinated, the disease may be cut short at any one of its stages, and disarmed of its dangers. The eruption is rendered slighter, and less likely to leave pits. The fever is slighter, so much so as often to exceed very little that of chicken-pox. It may be affirmed that as a rule vaccinated cases of small-pox recover with very little of ill effects of any kind, beyond discolored traces of the pustules, which gradually fade away.

Malignant Small-pox.—This form of disease is marked from its outset by signs of nervous depression, and deterioration of the blood. The pulse indicates loss of strength, while the blood shows grave alterations in its composition, such as blood spots on the skin, resembling bruises and flea-bites. The pimples scarcely go into the vesicular or pustular stage, but becomes filled with extravasated blood, giving them a purple hue. When vesicles of this character are seen, even if it be among others of a healthier aspect, they betoken more than usual danger. Hæmorrhage from internal organs most commonly follows, and the patient succumbs in the course of a few days.

The conditions most favorable to recovery from small-pox are youth, previous good health, and vaccination. The unfavorable circumstances are infancy and old age, the supervention of other diseases, such as erysipelas, boils, abscesses, congestion of internal organs, and pregnancy. This last is almost always attended with abortion in small-pox.

Inflammation of the coats of the eye is very prone to occur during an attack of small-pox—in severe cases running on sometimes to the total destruction of the globe of the eye.

PROPAGATION.—Small-pox may be propagated by infection, or by inoculation. The latter is now never practiced, since it has been made to be, in law, a felony, punished by heavy fine or imprisonment. The incurrence of the disease by infection is called "taking it in the natural way." How long after the subsidence of all the symptoms of small-pox an individual may be able to communicate it "in the natural way" is not known. Probably no risk exists of its propagation from the person after all the scabs have fallen off, and the patient has had repeated baths. To prevent its propagation the thorough disinfection of all clothing and bedding should be effected as early as possible.

TREATMENT.—For the disease itself the treatment consists more in watching its course and relieving complications than in the administration of remedies with any view to cure. Small-pox having a definite course cannot be interfered with by active treatment without fear of causing mischief:—all that need be done is to administer some mild aperient in the outset, and then some simple saline mixture if the fever run high. A mild distinct case is far better left to run its natural course. Separation of the sick from the healthy, and a plentiful supply of pure air, are of greater importance, almost, than the adoption of curative measures. The sleeplessness and delirium which often attends the febrile state that accompanies maturation of the vesicles, are readily allayed by Dover's powder. If the entire surface of the body be sponged daily with warm water, or vinegar and water, the irritation of the skin is much allayed thereby. Inflammation of the eyes should be immediately attended to. A small piece of linen rag, dipped in cold water, or Goulard water, should be laid over the eyelids and be kept constantly wetted. The main treatment of mild or simple small-pox resolves itself into nursing and dieting. During the early febrile stages, diet of bread and milk is the best. Light slops, such as broths, may be allowed also, and ripe fruits, such as grapes, oranges, etc., to allay thirst. When the process of scabbing has advanced a few days, and the secondary fever is on the decline, meat should be given, and if the pulse becomes feeble some wine in addition will prove

beneficial. In the severer or malignant small-pox, wine or brandy will be required earlier. The indication will be a sense of sinking expressed by the patient, and feebleness of the pulse. In the malignant or hæmorrhage form wine should be given to begin with, and doses of the muriated tincture of iron.

Prevention of Pitting.—A point in treatment to which great importance is attached is to prevent pitting or scarring. Countless have been the schemes that have been put forward with great boast and pretention as infallible preventives of the disfigurement. Having tried a great many of the plans, and seen them tried on a great scale, we cannot advise our readers to rely upon any one that has yet been put forward, except previous vaccination. This exerts such a controlling power over the disease that it, even in severe cases, may pass away without pitting. The separation of the scabs is promoted by painting them with sweet oil as soon as they are formed.

Spasm, or Cramp, may be a symptom of some nervous affection, or of inflammation of some internal organ. Essentially they are the same thing, but a distinction is generally made to the effect that spasm affects internal muscular parts, as of the stomach or intestines, while cramp affects the muscles of the limbs. Internal cramp or spasm may be distinguished from inflammation by pressing on the part. Steady pressure gradually affords some relief in spasm, whereas the pain is increased thereby if its cause be inflammation.

Treatment.—For immediate relief of spasms or cramp, an adult may take laudanum, 20 minims; ether, 30 minims; or, chloric ether, 30 minims, in a wineglass of water. And repeat every three or four hours.

Splinters, Thorns, etc.—These should be removed, if possible, by the use of forceps. If they are left in they may cause inflammation, and the formation of abscesses, or gatherings. If the foreign body cannot be extracted, a linseed-meal or bread-poultice should be applied. Matter will probably form, and may be required to be let out by a puncture, in which case most probably the thorn or splinter will be evacuated at the same time. The inflammation will begin to subside as soon as this has occurred.

Stings of Insects, etc.—Symptoms.—The stings of wasps or ants, or bees, as, indeed, do most of the bites of insects, present very much the appearance of what are called poisoned wounds. The history of the case will generally be that the patient has suddenly felt a very sharp pain in the part affected, though, perhaps, he has not noticed any unusual appearance about it. Within a short, but variable period, there is a feel-

ing of irritation about the spot, which rapidly becomes red and swollen, and sometimes acutely painful. On close examination, it will be found that there is a small speck about the centre of the inflamed part, and in this the sting of the insect is sometimes found. The severity of the symptoms will of course vary, according to the state of health, or constitution of the patient. The inflammation may be confined to a small circumscribed spot, or it may spread over a whole limb, and be attended with signs of prostration.

Treatment.—If the sting have been left in, as it usually is by wasps, it should be carefully extracted, if it can be got hold of, by forceps or tweezers. If there be simply a small red irritable spot, it will be sufficient to dress it with a cold evaporating lotion, such as the following:

Vinegar, 1 ounce; spirits of wine, 1 ounce; water, 4 ounces. Mix. This should be kept constantly applied by means of a piece of lint, or soft linen rag.

Spirits of salvolatile is also very useful for local application in slight cases of stings. Should, however, the inflammation spread much, poultices of linseed-meal should be applied.

Should the wound have been inflicted by a snake or other venomous insect, and the system be at all affected, if the patient seem faint or prostrated, stimulants should be given freely, thus: Spirits of salvolatile, 1 drachm; water to 1 ounce; every hour; or brandy and water, if the ammonia be not at hand. If the bite proceed from some animal, whose bite is known to be of a dangerous nature, nitrate of silver should be freely applied to the wound as quickly as possible. If the wound be on a limb, it will be as well to tie a handkerchief or other ligature tightly round it above the part bitten.

The venomous effect of certain snake bites, as that of the cobra di capello, are so rapid in their development that, unless speedy or immediate aid be rendered, the patient will stand but little chance of recovery. The bite of the adder is occasionally followed by very serious symptoms. The bite, or rather the stings, of certain scorpions are often of a severe nature. In nearly all cases of snake-bite, the symptoms consist in a fearful state of depression, during which, unless the strength be supported, the patient will sink.

If the wound be inflicted on one of the limbs, a ligature should be very tightly tied round it above the wound.

The object of the treatment, as above stated, is to support the strength of the patient until the poison shall have passed out of the system.

Stomach-Ache: 1. In Children; 2. In Adults.—1. To begin with this very "common heritage" of infantine and

childish "woe," first and foremost show your sense, as far as a fond (and foolish?) papa or mamma can be supposed to show it, by preventing the "little ones" from eating and drinking what you know, and they don't know, to be a likely *fons et origo malorum*. For instance, prevent their eating raw and unripe fruit; going into the garden and picking and swallowing green peas, sour gooseberries, and so on; in short, keep them on their proper diet, eggs and milk, in especial, the only two perfect *per se* kinds of food; good brown bread, made at home of whole-ground wheat, infinitely more nourishing than the fine white bread, too often adulterated, for the sake of the color, with alum, to the ruin of the teeth and confinement of the bowels; Scotch oatmeal porridge, with plenty of milk, not odious salt and the like. N. B.—Do not expect your young child to thrive on tea and white bread and butter only; still less on buttered toast. A growing child needs something better at breakfast than that. If you yourself know nothing about the proper diet for a child, then buy one of the London Hospital Pharmacopœias, particularly one of the "Children's Hospital Pharmacopœias," at the end of which a proper dietary for a child, according to its age, is given.

If stomach-ache does come, in spite of all reasonable precautions, then, if you have no doctor at hand, or in case you don't, in your wisdom, think fit to call one in, or in case you cannot pay him if you do—then, *faute de mieux*, give from a quarter of an ounce of tincture of rhubarb to half an ounce, according to age and strength, with from two to four drops of laudanum, and four or five drops of essence of ginger in about a wineglass or a little more of water. A little sugar and grated nutmeg in it will do no harm, and make it more palatable. Cut him, or her, as the case may be, a bit of thin fresh lemon-peel, and give it to set the little teeth into as soon as the *succus amarus* is swallowed, to take the taste away; or, if you cannot get this, then a thin slice of a ripe apple, or a small suck at an orange. A child won't take medicine any the better another time, for having had the nasty taste in its mouth for minutes after it has swallowed its first dose. Put the child to bed, warm and comfortable; and, if the pain continues, repeat the dose, and apply warm fomentations, flannels wrung out in hot water, with a few drops of spirits of turpentine sprinkled on them to the pit of the stomach.

Better still, if you are near and have access to a hospital dispensary; or, failing that, to a good chemist's, then have the following recipe made up, and give it: Ten grains of carbonate of magnesia; 10 grains of aromatic powdered chalk; 15 to 20 drops of the tincture of rhubarb; 1 ounce of peppermint water. Repeat the dose in half an hour if the pain be not quieted. This will suit a child of eight or ten years of age.

For pain in the stomach in infants, try, before you give Dill or any other medicine, gentle pressure with the palm of the warm hand on the abdomen, quietly and steadily applied. The pain, probably owing to wind only, will pass away.

N. B.—Have woolen clothing (as soft flannel) worn next the skin. Whole-meal bread, but not bran bread for little children, and fine oatmeal only should be used. Avoid newly-baked bread too. Second day bread is the best, well-fired, and not raw and doughy.

If pain be aggravated by pressure and rubbing, the stomach-ache may be more serious, and advice should be sought. Warm light poultices and one dose only of castor-oil. The directions for the use of laudanum must be regulated according to the age of the child; viz., one drop for every year of its age. For adults, the castor oil and peppermint draught should be advised too.

2. In an Adult.—Act much in the same manner as with this complaint in a child, if you have nothing better within reach than tincture of rhubarb; only, of course, use a stronger dose, say from half an ounce to an ounce of the tincture, and from five to ten drops of laudanum. In case you can get it made up, probably no better prescription can be given than that which bears in Hospital Pharmacopœias the barbarous Latin name of *Haustus carminativus*, the draught, that is, that acts like a charm, viz: Five grains of rhubarb powder, with the same quantity of powdered ginger; 10 grains of bicarbonate of soda; 20 drops of the aromatic spirits of ammonia, and 1 ounce of cinnamon water; or, if you cannot get that, plain water will do.

Stone-Pock.—Symptoms.—This troublesome and disfiuring affection of the skin has the synonyms of "Acne," "Carbuncle-race," and "Rosy drop." It consists in scattered pimples, occurring usually on the face, chest, back, and shoulders. They appear first as small hard pimples, with minute black points, consisting of obstructed openings of the glands of the skin. After an uncertain period, the pimples increase in size, become inflamed at their base, pus forms, presenting yellow heads, then scabbing off in the course of a week or ten days. This is the form in which the eruption makes its appearance in the young and healthy, about the period of puberty, to their great annoyance and discomfort. In advanced life the eruption assumes a congestive character, and is of a dark or fiery red hue, often very obstinate and chronic in its nature. It is this form which has acquired the rather approbrious synonym of "Carbuncle-face."

Treatment.—However anxious young people may be to

get rid of what they feel to be a very disfiguring eruption, they must make up their minds to endure it with as much patience as may be, since it will often last for a year or two, and then gradually disappear. We would, therefore, warn our readers against taking strong medicines with a view of getting rid of it. A more important point is attention to diet and the general state of health. A nutritious, unstimulating diet should be taken. A simple aperient of an alkaline character, taken occasionally, together with the use of mild lotions, are the utmost that should be attempted. Thus, for aperient mixture: Bicarbonate of potash (or soda), 2 drachms; infusion of senna, 2 ounces; infusion of gentian, 6 ounces. Mix. Take an eighth part twice a day. For lotion: Corrosive sublimate, 2 grains; rose-water, or pure water, 8 ounces. Mix, and mark "poisonous." Apply to the skin night and morning. Or, common washing soda, 1 drachm, to a pint of water, and apply freely, drying the skin again with a soft towel. Or, half an ounce of bicarbonate of soda, or potash, added to the water of a sponge bath.

The chronic form of acne may be taken as a type for the treatment of chronic diseases of a pustular order generally.

In all these, attention to diet is equally important, but it may be fuller, and some stimulant should be taken in the cases of adults. The internal use of arsenic, and of mineral acids, according to the age and state of constitution, will be found most serviceable, due attention being paid also to the functions of the liver and kidneys. The following prescriptions may be tried: Diluted nitric acid, 2 drachms; compound tincture of bark, 10 drachms. Mix. Take a teaspoonful three times a day in a wineglass of water. Or, Fowler's solution of arsenic, 1 drachm; solution of potash, 3 drachms; tincture of gentian, to 2 ounces. Given as above. The dose of solution of arsenic should be cautiously increased by 30 drops to the bottle at end of each ten days, for about three times. The dose will then be as large as it will be safe to entrust to non-professional hands.

If, during the administration of arsenic in these small medicine doses, there should occur griping sickness and itching of the eyelids, the medicine should be stopped. Its use should also be discontinued if it seems to exert a depressing influence on the system.

For outward application, in chronic acne and other pustular affections, there are several ointments and lotions. Thus: Sulphate of zinc, 20 grains; glycerine, 1-2 ounce; water, to 6 ounces. Mix.

Stranguary (Difficult Micturition). — Symptoms. — This spasmodic affection may be caused by the application of a

blister-plaster or of blistering liquid to any part of the body; or by inflammation of the bladder or other disorder of the urinary organs; by hysteria or by pregnancy. The spasm causes great distress by the ineffectual efforts that are made to empty the bladder, which, the more it is distended, the more severe the pain becomes, so that the slightest movement or pressure becomes intolerable.

TREATMENT.—It is caused by the irritation of a blister-plaster, a sedative (as tincture of henbane, or laudanum) and warm drinks, with time, will relieve the suffering.

When it proceeds from internal causes it will depend also on these for its treatment; when, however, it occurs in hysterical states, the tincture of perchloride of iron, with tincture of valerian, or assafœtida, may be tried. (See List of Medicines.)

Struma, or Scrofula.—This is an unhealthy state of constitution, which gives a character to the diseases or disorders of those who possess it. Thus it is regarded as the basis of glandular swellings in the neck, and is somewhat loosely spoken of as "scorbutic habit of body."

All diseases occurring in strumous habits require a supporting and tonic treatment.

Sunstroke.—SYMPTOMS.—These resemble the symptoms of congestion of the brain, and come on occasionally with great suddenness after exposure to the direct heat of the sun. In other cases the symptoms are slower in their approach, and in children resemble those of affection of the brain from teething.

TREATMENT.—Apply cold to the head, and mustard-plasters to the soles of the feet and calves of the legs, giving repeated moderate doses of stimulants at the same time.

Swallowing Foreign Bodies.—It often happens that children swallow money, or other hard substances, such as pins, etc. In these cases, if the substance be completely swallowed, it should be left to take its course through the stomach and intestines. The custom of giving purgatives in such cases is altogether contrary to physiological principles, as the intestinal movements will more safely carry them through than if violently urged by physic.

Toothache, How to Treat.—To alleviate the wretched pain —for nothing probably short of "cold steel," that is, extraction, can work a perfect cure—take at once a tolerably strong dose of opening medicine; as soon as this operates, in all probability the pain will be gone for a week or two. Meanwhile, apply a small mustard poultice outside, just over the place where the pain is most violent, and rub the gum and the

tooth with chloroform and laudanum. It will ease the dreadful pain. A little bit of cotton dipped in a solution of shellac, or of gum mastic and spirits of wine, makes a good temporary stopping for bad teeth. Avoid the ordinary vaunted "nostrums," that is, the quack medicines said instantly to remove toothache. Kreasote is the safest domestic remedy to employ, if the pain be very bad; only get a friend to employ it, by putting a little bit of cotton-wool dipped in it into the hollow of the tooth for you, and do not try to put it in yourself, or you will scarify your tongue and gums.

Vomiting, Obstinate.—When the Stomach will Retain Nothing.—General Directions, when a Doctor Cannot be Got.—Keep the patient perfectly quiet, in a bed, if possible, and on his back. Give no food for some time, and then only teaspoonful doses at a time, with long intervals; leave him to himself for an hour or two; then give five drops of chlorodyne in a little water, and, after an interval, a little chicken-broth or beef-tea. Milk, pure and simple, or milk with lime-water, in very small quantities at a time, is often useful. If you cannot keep these down lay a piece of lint soaked in a teaspoonful of brandy and a teaspoonful of laudanum mixed, on the pit of the stomach, cover it with a bit of oiled silk or guttapercha twice the size of the lint, and renew it every four or five hours. A mustard plaster will answer the same purpose, and is, probably, more easily procured. Either application will help to quiet the stomach. A teaspoonful of lime-water in a teacupful of milk or of cold beef-tea (I have found that the stomach will always keep down the white of an egg, well beaten up with a teaspoonful of brandy, and given a very little at a time, when it would retain nothing else), or of arrowroot, will often abate the vomiting and enable the stomach to retain a small quantity of food.

Thirty drops of wood naphtha and as much of the tincture of cardamoms, in a tablespoonful or two of water is sometimes used in this distressing complaint, and with success. It is very useful in preventing the vomiting of consumptive patients. Other experienced doctors say, use one drop of ipecacuanha wine every half hour.

Typhoid Fever.—Intestinal, or Enteric, Fever.—Symptoms.—This fever generally begins with slight premonitory symptoms, such as chilliness, loss of appetite, and heat of skin; sometimes vomiting, and generally diarrhœa, which seems to defy remedies. The patient becomes weaker, and, from about the seventh to the tenth day from the seizure, there appear on different parts of the body—generally on the back and front of the chest and abdomen—rose-colored spots, which are slightly

raised above the surface, but which disappear on pressure, and quickly return when the finger is removed. At first, only two or three make their appearance, and are liable to be overlooked. More come out, but they are very variable in number; in ordinary cases, about a dozen. In forty-eight hours these spots fade out, and are replaced by fresh ones; this crop also fades as the former, and is replaced by another, and so on. The probable severity and danger bear some relation to the number of the spots; the abdomen feels hard, and is tender, but more particularly just above the right groin. The tongue is furred in the centre and red at the tip, as the diarrhœa continues, the motions being loose, sometimes quite black, at other times light-colored. If this continue, the tongue becomes ulcerated, brown, and dry. The teeth become caked over with a brown matter called "sordes," and there is great thirst. The pulse ranges between 90 and 120. The temperature will reach 102 degrees to 104 degrees. The patient may become delirious, but this does not always denote that the disease will assume a serious form. In favorable cases the improvement is generally slow. It is indicated by the number of stools diminishing and becoming more and more solid. The spots disappear, the skin becomes cooler and moist, the appetite returns, and, as convalesence progresses, sometimes becomes ravenous. The appetite requires to be carefully controlled during convalescence. Ulceration of the bowels being the dangerous tendency of the fever, indiscretion in diet will easily induce a relapse.

TREATMENT.—The diet is an important point in the treatment of the disease. It should consist of light fluid food, easy of digestion; nothing solid should on any account be given. The patient should have milk and beef tea, coffee or tea; arrowroot or gruel are both useful. The staple article of diet should be milk during the first ten or twelve days, unless symptoms of extreme debility should occur, in which case beef tea and port wine may be given. Soups also may be given, but care must be taken that they are clear from indigestible fibres of meat and vegetable.

The administration of wine is often a most difficult problem in the treatment of fever. If the signs of debility are so evident as to render prostration imminent, an ounce of port wine, or even brandy, may be given every four or six hours; but it is necessary to caution the reader not to mistake the feeling of weakness, which is an inseparable attendant on fever, for dangerous debility. A vastly larger proportion of cases would do well without stimulants than is generally believed. It may be a help to the determination of the question if we point out some symptoms that will call for the use of alcoholic stimulants. These are great fluctuations in the number of the pulse

and in the degrees of temperature of the body, and a want of muscular power to maintain a comfortable posture in bed, accompanied with sighing and irregular breathing. It may be stated broadly that it is not the number of the pulse that is so important as its steadiness. A pulse of a hundred and fifty—if it continue day after day at that number—affords a better sign than a pulse that beats a hundred at one time, and a hundred and twenty at another, and a hundred and something else at another time. The same remark applies to the readings of the clinical thermometer. If these are steady, the case will, in all probability, do well without the use of alcohol.

For medicinal means, but little is required in the shape of drugs. Some simple effervescing saline, or soda-water, which will serve to allay thirst and fever, will suffice in mild cases. Dilute hydrochloric acid, in small doses, is often of some service. Diarrhœa may be checked by chalk mixture, to which, if there be pain in the bowels, small doses of Dover's powder may be added. If there be tenderness on pressure of the abdomen, a mustard plaster may be applied, or a linseed poultice should be kept on day and night. When convalescence begins it may be assisted by the administration of quinine.

Typhoid fever has a specific duration, viz.: either twenty-one or twenty-eight days; this, the ordinary duration, may, however, be interfered with by the complication of inflammation of any internal organ, and convalescence may be prolonged through many weeks by the occurrence of mischief in the intestines. The termination of the disease, if not in health, is in exhaustion; or sometimes by inflammation in the cavity of the abdomen, through the perforation of an ulcer in the intestines. In this last case, pain of a most intense character sets in suddenly, and is rapidly followed by collapse and death.

Typhoid fever is not, as supposed, a milder form of typhus; it is distinctly different. Typhus is infectious; typhoid is not. The prominent symptom of typhus fever is the disturbance it causes in the brain. Diarrhœa is the prominent symptom of typhoid.

The above distinctions are sufficient reasons with some authorities for dispensing with the name "typhoid," as that, from its similarity to "typhus," is liable to mislead, hence the name "Enteric" as the more appropriate distinctive designation of this fever is frequently employed.

Typhus.—This is an infectious fever of a very grave character, known under various names as jail-fever, camp-fever, etc. It begins like most other fevers with indefinite symptoms of malaise, lasting an uncertain period. The incursion of the fever is sometimes sudden, commencing with a shivering fit,

headache, and feeling of extreme debility. As the fever becomes more pronounced, the pulse is rapid, the temperature of the skin above 100 degrees; thirst becomes urgent, the tongue furred; vomiting sometimes occurs. Severe headache and delirium occur early in the course of this fever. With the advance of the disease, the tongue becomes coated with fur, the eyes bloodshot, the skin hot and dry, the urine scanty, and the skin assumes a dusky hue.

A characteristic eruption, distinctive of symptoms, appears on the chest and body, usually after the fifth day. By the peculiar features of this eruption, the disease may be identified and distinguished from typhoid. The appearance of the eruption somewhat resembles that of measles, but has mixed with it numerous minute spots like flea-bites. The stress of typhus is on the brain, as manifested by the early occurrence of severe headache, delirium, painful dreams, sleeplessness, twitching of the muscles, and, lastly, coma. The bowels, usually, are confined, a condition the reverse of what is observed in typhoid. Cough and shortness of breathing direct attention to the organs of respiration, inflammation of the lungs of a low and insidious character, being one of the most frequent and most dangerous complications of this fever.

Typhus fever has no definite duration, like typhoid, but generally declines in fourteen days, although some cases last many days longer.

Treatment.—A well ventilated apartment is essential to the success of treatment, and should by any means be secured. In the winter time a fire should be kept burning, as it not only supplies warmth, but it secures a change of air in the apartment. The tendency of typhus being towards depression and prostration of the nervous energies, the point in treatment is to support the vital powers by beef tea, milk, port wine, or brandy. The dose and the frequency of the repetition of the stimulants must be guided by their effects on the pulse.

In cases where the debility is extreme and the pulse very rapid, a judiciously administered dose of alcohol will give it force and reduce its frequency. In this case the dose should be repeated at intervals of two or three hours, closely watching the effect on the pulse. In cases in which the debility is not so intensely marked, wine may be omitted, and the patient supported on milk, beef tea, soups, etc. Mild aperients should be given if the bowels be costive, and for medicine, four or five grains of carbonate of ammonia, dissolved in water, should be given every four hours.

The head symptoms—e. g., headache, delirium and sleeplessness—will be relieved by blistering the back of the neck. (See Blistering.) If the head be hot, ice-cold water should be

constantly applied. If the excitement of the brain prevent sleep, a small dose of Dover's powder at bed-time will have a soothing effect, and perhaps favor perspiration. If there is cough and symptoms signifying that the chest is becoming affected, mustard-plasters should be applied. We repeat, however, that the most important of all measures is good nursing and careful dieting.

The infection of typhus may be guarded against by the free use of disinfectants, such as carbolic acid or Condy's fluid (see Disinfection), and by free ventilation, which is of the first importance, and goes a long way to prevent the spread of all sorts of infectious diseases.

Vaccination.—Vaccination is the insertion into the human system of the infectious matter of a mild disease called cow-pox. Cow-pox is really small-pox, which, having been acted on by the system of the cow, has been thus rendered innocuous to the human body, at the same time that it is protective of a second attack. Thus, in vaccination we have a mild and harmless form of small-pox, which is voluntarily accepted in the place of the more malignant form of small-pox, which seizes its victims against their will.

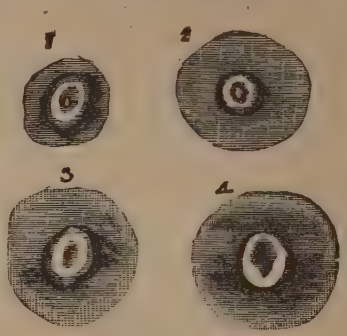
Vaccination is the only real protector we have against the ravages of small-pox. This is proved by the following facts, among many others: In proportion as vaccination is properly and efficiently performed, so the mortality of small-pox is reduced. Secondly, by the freedom from infection which is enjoyed by properly re-vaccinated persons, in constant attendance upon, and actual contact with, small-pox patients. There has never been a case of small-pox among the nurses or the attendants at the Small-pox Hospital, Highgate, within a period of considerably over thirty years. This is simply because they are all properly re-vaccinated before they enter upon their duties.

Mode of Vaccination.—The operation of vaccination is simple, but so highly important that no care bestowed upon its performance is thrown away.

The following instructions will be sufficient, if carefully followed: Select an arm of a vaccinated infant that has good vesicles on the eighth day, i. e., the day week on which the lymph was inserted. Then, with a perfectly clean lancet, make several punctures in the clear part of the vesicles, avoiding the red border of the inflamed skin, so as not to draw blood. A clear watery fluid will ooze out in beads. Take off some of this clear fluid on the point of the lancet, and then, taking the arm of the infant, or person to be vaccinated, draw the skin tense and insert the point of the lancet nearly horizontally

into the skin to an extent of about one-tenth of an inch (-); then give the lancet a turn round, withdraw it, and press it down upon the puncture. Five such punctures, to the distance of about half an inch apart, should be made on one arm.

Supposing that an arm with mature vesicles should not be available, lymph may be procured from any vaccine station. It will be received in that case, preserved either in tubes, or on small points of ivory. If in tubes, the point at each end of one must be broken off, and the contained lymph be gently breathed on to the point of the lancet, and inserted as above directed. If the lymph have been preserved dry on "points," one of these should be used for each puncture. Dip the point quickly into cold water, and shake off any excess of water. The object is just sufficiently to moisten the lymph, that it will be easily scraped off on to the point of the lancet, and inserted as before directed.



VACCINE VESICLES.

Some degree of inflammation occasionally occurs on the vaccinated arm. This will generally disappear quickly under the application of simple water-dressing. A slight eruption of small, colorless pimples on various parts of the body also occasionally follows vaccination, and disappears in the course of a few days.

To ensure the success of vaccination, the infant to be vaccinated should be in good health, and free from any eruption of the skin, and the child from whom the lymph is taken should also be in perfectly good health. With these precautions, there is no ground for the fear that other diseases than cow-pox will be transmitted by the operation. Very great exaggerations and misrepresentations have been put forth on this point in order to excite prejudice against vaccination.

Re-vaccination.—The primary vaccination of infancy, if well and thoroughly performed, as shown by the existence of several well-marked cicatrices, affords protection for life from severe small-pox—protection, however, not so complete but that modified small-pox shall not occur. It is shown by a vast accumulation of statistics that there is a greater tendency in vaccinated persons to take the small-pox between the ages of fifteen and twenty-five than at all other ages put together. It is, therefore, advisable, in order to obtain complete protection, the operation of vaccination should be performed at puberty.

or when growth is completed. The insertion of lymph by three punctures is sufficient for re-vaccination. The lymph from a re-vaccinated vesicle should never be used for primary vaccination.

Voice, Loss of.—Sometimes without the existence of catarrh, or inflammation of the larynx, the voice suddenly becomes reduced to the faintest possible whisper, or without great difficulty even this is not achieved. It occurs sometimes after long continued speaking, but it is most frequently met with in hysterical females. The same thing may, however, happen as the result of a cold, or from a more serious cause, some form of paralysis of the organs of the voice.

TREATMENT.—When the affection is the result of catarrh, it may be relieved by the inhalation of the steam of hot water, with a few drops of creasote, or a teaspoonful of spirits of salvolatile. When it proceeds from hysteria or paralysis, the treatment must be sought under the heads of those diseases.

Wounds, Cuts, Stabs.—These are of several kinds—e. g., incised, contused, lacerated, punctured—requiring each a modified treatment.

INCISED WOUNDS.—These are clean cuts or wounds, with smooth defined edges.

CONTUSED WOUNDS—Are wounds attended with bruising of the parts, such as seen in gunshot injuries.

LACERATED WOUNDS—Are pretty much the same as bruised wounds—the edges are rough and jagged.

PUNCTURED WOUNDS—Are where the orifice of the cut is small, but its extent deep, such as in stabs.

TREATMENT.—INCISED WOUNDS.—In the case of incised wound or clean cut, if not large in extent, it will heal readily by the edges being brought together by means of some simple unirritating plaster, such as "adhesive plaster," or "isinglass plaster," or goldbeater's skin. It may be advisable to bring the edges of a wound together with stitches. The most convenient needle for this purpose is a glover's needle, and white silk is the best material for the sewing. If the wound has been inflicted by broken glass, etc., the surfaces should be carefully searched for any fragments or foreign bodies, before the edges are brought together. If the bleeding be profuse, the wound should be left exposed to the air for a while, or the ordinary means used to stop the bleeding. If the cut be a long one, there should be small intervals left between the strips of plaster, in order to allow blood or other fluids to escape. This strapping plaster need not be removed for three or four days,

unless there be pain and throbbing in the wound; in this case they should be loosened, or even removed, as these symptoms indicate inflammation. If it be necessary to remove the strapping before union has taken place, the wound should then be dressed with water and lint, covered with oil-silk or gutta-percha.

Scalp Wounds.—Cuts on the scalp should be carefully cleansed from hair, which should also be removed for about half an inch around the wound. If small, the edges can be brought together with plaster. If the wound be large, it is better simply treated with cold water dressing. No stitches should be put in these wounds, unless they are very ragged and gaping, as they are prone to excite erysipelas in this part of the skin.

Bruised, Contused, and Lacerated Wounds. — In consequence of the tearing or bruising of the edges of a lacerated wound, the vitality of those parts is more or less impaired; hence these wounds do not heal as readily as a clean cut. In treating a contused wound, the surface should first be carefully sponged clean of clotted blood, or foreign bodies of any kind, such as portions of clothing, small shot, etc. The simple water dressing, or wet lint, covered with oil-silk, is the most suitable for this kind of injury. If the soft parts be much torn, they may be bound down by a roller and water dressing applied. After a time, the surface of a wound of this kind becomes sluggish in its healing, and resembles an ulcer. It should then be treated with zinc ointment or yellow basilicon.

Stabs, or Punctured Wounds—Require special treatment, varying with their depth, and the part in which they occur. A slight wound of this sort, not penetrating deeply, may be dressed with isinglass-plaster, adhesive-plaster, or gold-beater's skin. If, however, deeper, but not entering a cavity, the simple water dressing should be applied, and the part wounded be so placed that blood may escape freely. For this reason it is not advisable to endeavor to heal a punctured wound quickly. If the bleeding from the wound does not stop from the exposure to cold, the wound may be plugged with lint or soft linen, soaked in tincture of perchloride of iron, diluted with an equal quantity of water, or with tincture of matico. The plugging may be allowed to remain in twelve hours. After its removal, if the bleeding be checked, dress as above directed with water. A deeply punctured wound is prone to heal at the surface. This should be prevented by inserting a strip of linen between the lips of the wound, so as to allow of the escape of matter. The healing from the bottom is sometimes to be promoted by injecting with a weak solution of Condy's fluid (a teaspoonful to a pint of water).

Stabs, or Punctured Wounds of the Chest.—The danger of these will depend upon the fact and extent of penetration. Those wounds that do not penetrate the cavity of the chest may be treated as ordinary stabs. (See previous directions.) Penetration of the chest is probably attended with a wound in the lung. This may be inferred if there be difficulty in breathing, or spitting of blood, with distress and anxiety of countenance.

The first indication of treatment in wounds of the chest is to give remedies to stop the bleeding. Should this proceed from a vessel in the wall of the chest, it should be sought for, and, if possible, tied; should it, however, proceed from the lungs, ice and cold drinks should be given.

For the organs within the chest, see diagram, which will point out the parts probably wounded.

A draught as follows: Tincture of opium, 20 minims; infusion of oak-bark, to make one ounce. This should be given every hour until the patient sleeps, and then discontinued. The sleeping is important, as it diminishes the force of breathing, and so insures a certain amount of rest to the wounded lung. The wound in the wall of the chest should then be accurately closed with stitches, or plaster, and the patient kept as quiet as possible.

Should there be any heat, swelling, or pain in the part, or should the patient have any shivering fits, small doses of opium should be continued at frequent intervals; thus: Compound ipecacuanha powder (Dover's powder), two and a half grains. Every two hours. It will be as well, when these symptoms show themselves, to give the patient also half an ounce of Epsom salts, in order to open the bowels. He should be allowed a light, cool diet.

Pleurisy is often a consequence of wounds in the walls of the chest. For its treatment, see under the name "Pleurisy."

Punctured Wounds of the Abdomen.—These may be slight and easily repaired, or they may be so serious as to end fatally in the course of a few hours. The gravity will depend upon the amount of injury inflicted upon the intestines. The following divisions of the subject will illustrate this point:

1st. NON-PERFORATING WOUNDS.—A simple wound of the walls of the abdomen, not passing through into the abdominal cavity, is not more serious than an incised or punctured wound elsewhere, and should be treated in the same way. A probe, or the finger, will readily detect the fact of a perforation; besides that, in the event of such an occurrence, there will probably be more severe pain in the part.

2d. PERFORATING WOUNDS.—In the event of a stab of the abdomen passing through its walls, either the intestines, or some other organ, may be wounded. Which of these may be injured, it may be difficult even for a surgeon to determine exactly. As, however, this treatise will be of more service to those who are beyond the reach of surgical aid, we shall endeaver to assist their diagnosis by referring to the positions of the principal internal organs relatively one to the other. A perforating wound, reaching to any one of the organs in the abdomen cavity, is attended with symptoms of alarming prostration. Means should be taken to stanch the bleeding of the external wound, and the patient must be supported by stimulants and light diet. Opium must be given freely to relieve pain. It acts beneficially also by moderating the muscular movements of the intestines. If there be vomiting of blood, it may be feared that the stomach is wounded. There is every inducement and hope that by rigidly enforcing rest and quietness, with the above means, life may be saved. Wounds even of the liver and spleen have been known to heal.

The next most serious effects of stabs in the abdomen, and those which give rise to great fear for the results, are those attended with protrusion of the intestines. If, however, the latter be not wounded, it may be returned, and the wound closed as directed above. Wounds of the walls of the abdomen, through which the intestines protrude, and are themselves wounded, call for particular treatment.

The wounds in the intestines should first be attended to. The edges of these should be united by means of a continuous or glover's stitch, similar to the stitch used in hemming. It should be so done that the exterior surface of the bowel, on either side of the cut, shall be in contact; and then the bowel having been carefully washed in luke-warm water, should be returned, stitches and all. If all goes on well, the silk will be removed by the bowel when the wound is healed. The after treatment is to be conducted as for a simple punctured wound. The general treatment of the perforated wound of the intestines will be the same as that of wounds of other organs in the abdomen—viz., rest of the parts secured by opiates, and support of the system by stimulants and light food.

GUNSHOT WOUNDS are perforated, bruised wounds, compli-

cated with nervous shock. These wounds do not bleed so much as cuts, but they are more troublesome to heal on account of the large amount of destruction of tissue they occasion. This varies on account of the size of bullet. Another cause for their being more dangerous than cuts is that it sometimes happens a piece of the wad becomes lodged in the wound, and being difficult to detect, is sometimes left behind when the bullet is extracted, causing mischief by its presence until removed or thrown off in the sloughing of the wound. Inflammation generally sets in about the wound within twenty-four hours. The external parts become swollen and red, the patient complains of pain in the wound. After another day or so a discharge of pus and matter appears. The bruised parts, or rather those parts with which the ball in its passage has come in contact, will now begin to be cast off by sloughing, though this process may occupy several weeks before all the dead parts or foreign substances are cast off. Mortification may follow a gunshot wound if the destruction of tissue be considerable, or if much bone be included in it; if the patient be in a bad state of health, or if the atmosphere is confined and of an unhealthy character.

TREATMENT.—Stimulants, such as brandy or wine, should be given to relieve the depression; then, if the bullet has completely passed through, the surface should be cleaned, and a piece of wet lint should be applied. This should be continued for three or four days, and then the patient treated as for a bruised wound. Bullets are frequently lodged in the wound. If visible at the orifice, they should be removed, but if not, there should be no attempt made by a non-professional person to find them, as much injury may be inflicted in the attempt to explore for them. Their removal must be postponed until surgical aid can be obtained.

Wounds and Bruises. Dressings for.—CARDED OAKUM STYPIUM.—A convenient dressing for confused and lacerated wounds. Oakum has this advantage, that where old rope is to be found, this substance can be made. It can, however, be obtained "carded" for surgical purposes, and in this shape, known as "stypium," it is a clean and useful means of arresting hæmorrhage from wounds by causing coagulation of the blood in its meshes, as well as absorbing discharges. The creasote, which is one of the constituents of tar, has preservative properties, stimulates a sluggish surface, and destroys unpleasant odors. It will be found very useful in the wounds of compound and comminuted fracture.

CARBOLATED OIL.—Solid carbolic acid liquefied by heat, 48 minims; olive oil to 4 fluid ounces. Mix. This is an ad-

mirable dressing for the suppurating surface of open wounds. It should be applied as follows: A piece of soft linen rag, rather larger than the surface to be covered, should be steeped in the mixture, and carefully drawn from the edge of the wound right across it until it is completely covered. Care should be taken to exclude all bubbles of air, which should be pressed gently out, in order that the oil may be in contact with the whole surface.

ISINGLASS PLASTER.—A very clean, simple and useful kind of plaster can be home-made—that is isinglass plaster. What is called "Persian" silk, is to be firmly stretched and painted with a moderately thick solution of isinglass, which is then suffered to dry. This plaster has the advantage of allowing the state of a cut beneath it to be pretty clearly seen—it is besides readily removed, when required, by the application of warm water.

Wounds, Hæmorrhage or Bleeding from.—MEANING OF THE WORD "TRAUMATIC."—We have elsewhere spoken of the various forms of hæmorrhage that arise out of the disease of the internal organs, and require what is, more strictly speaking, called "medical treatment." By "traumatic" bleeding is meant the consequence of wounding of the blood vessels, calling for surgical means to its arrest. Traumatic or surgical bleeding may be either arterial or venous, and require different treatment accordingly.

ARTERIAL HÆMORRHAGE.—When a wound or other injury causes bleeding of a bright or vermillion red color, the blood flows from an artery. This is rendered clearer still if the blood flow in spirts or intermittent jets corresponding with the beats of the pulse.

VENOUS HÆMORRHAGE is known by the even flow of the blood and its darker color.

TREATMENT.—VENOUS BLEEDING.—If the bleeding from a wound be of the dark venous character, or being, as is often the case, partly arterial also, but not very profuse, gentle pressure will sometimes suffice to check the flow; or the application of cold water or ice, or exposure to cold air, may stop the bleeding. A slight flow of blood can be arrested by matico, or by a piece of linen lint soaked in Friar's balsam or tincture of perchloride of iron.

ARTERIAL BLEEDING.—If the bleeding be arterial, as indicated by its flowing in jets, firm pressure should be made over the wounded vessel, if in such a position as to admit of it. Supposing that the pressure of the hand does not suffice to stanch the bleeding, then pressure should be made by tying a

handkerchief or bandage so that the knot shall press over the wound. If the wound has been inflicted on one of the extremities, the bleeding may be arrested by tying a ligature round the limb, so as to press a pad of lint upon the artery. If the pad be soaked in Friar's balsam, or tincture of matico, it will be of more service.

Arresting Bleeding from the Arm.—Pressure by the fingers on the main artery of the arm, as it passes in the armpit along the inner side of the arm under the shoulder joint, will assist in checking the hæmorrhage from a wound of the forearm or hand. The artery may also be firmly compressed at the elbow-joint by bending the arm firmly, and laying the hand of the same side on the point of the shoulder.

Artery of the Thigh.—In cases of obstinate arterial bleeding from any part of the lower extremity, firm pressure should be made in the groin, where the large artery of the limb may be easily felt beating as it passes down the thigh. When, by the means above described, the bleeding has been arrested, we should proceed to examine the wound with the help of a sponge, and search for the bleeding vessel.

Of Tying an Artery.—Supposing that all these means have been tried, and the bleeding still continues or returns when the pressure is taken off, the wound should be carefully washed with a sponge and cold water, and pressure being applied, the cut end of the wounded vessel sought for and tied, thus: When found, the bleeding end of the vessel should be taken hold of with a pair of fine-pointed forceps and held up, so that an assistant may pass a piece of silk or thread round it, which should then be tied into a double knot, taking care that the thread be not tied too tightly, as by doing so the artery may again be divided. One end of the thread should then be cut off and the other left hanging out of the wound, which should then be dressed with lint or linen dipped in cold water. The ligature will generally come away in about a week. There are other means of checking bleeding, if the vessel wounded is not very large, of which the following are the most handy:

A piece of lint or cotton wool soaked in the tincture of the perchloride of iron or tincture of matico may be pressed down into the wound in contact with the bleeding vessel. Or, the vessel should be lightly and rapidly touched with a piece of iron ware heated red hot. This is, perhaps, the most effective way of checking the bleeding, and is by no means so painful as it might seem. Another plan is to touch the orifice of the bleeding vessel with a stick of nitrate of silver.

Leech Bites.—The bleeding from these is often very troublesome, more especially when the leeches have been inad-

vertently applied at some part of the body where, from the absence of bone, there is a difficulty in applying firm pressure. For this reason leeches, when applied, should always be placed over some bone or other hard part upon which the necessary pressure can be applied and continued for some minutes. If pressure cannot, for the reason above stated, be applied, the bites may be touched with the point of a camel's hair brush steeped in tincture of the perchloride of iron, or they may be touched with a stick of nitrate of silver, and, as this is generally at hand, it is a convenient means. A ready method is to cut a small piece of glazed visiting card, and, having pressed with a dry handkerchief for a short time on the bites, then quickly, before the blood comes again, press the glazed surface of the card on the bite, and fasten it there with plaster or a bandage.

MATICO, AND TINCTURE OF MATICO.—A valuable styptic may be kept readily at hand by steeping a few matico leaves in a phial with gin, brandy or proof spirit. A piece of lint soaked in this will stay the bleeding of slight cuts. Matico leaf itself laid on a bleeding surface, or a slight cut, or a leech bite, will also stanch the bleeding.

FAINTING.—The faintness that often occurs in cases of bleeding, from whatever cause, favors the stanching of the blood. All that is required is to place the patient on his back with his head low, and administer some slight stimulant.

Worms, Intestinal.—SYMPTOMS.—Variable and vitiated appetite, fœtid breath, feverishness, grinding of teeth, picking at the nose, itching at the seat, disordered bowels, and pains in the stomach. There are three varieties of worms voided from the intestines, viz.: 1st, the round worm, resembling the common earthworm; 2d, the threadworm—some short white worms, some of a larger variety; 3d, tapeworm, the length of which extends to many feet, and which consists of small square joints.

TREATMENT.—The first two of these varieties may be expelled by doses of calomel and scammony, or of santonine. The third (tapeworm) requires either the oil of male fern (one drachm in an ounce of water), taken fasting early in the morning; or: Castor oil, one-half ounce; spirits of turpentine, one-half ounce; cinnamon water or peppermint water, 2 ounces. Mixed, and taken fasting.

It is seldom necessary to repeat this dose. The tapeworm when voided should be carefully examined in order to ascertain that the head is expelled, since, if this be not the case the worm quickly grows again. The head may be recognized by means of a common pocket lens. It is very minute, but is rounded, on a narrow neck, and presents on its surface sucking discs, by which it attaches itself to the inner surface of the bowel.

MISCELLANEOUS RECIPES.

Remedy for Diphtheria.—The treatment consists in thoroughly swabbing the back of the mouth and throat with a wash made thus: Table salt, 2 drachms; black pepper, golden seal, nitrate of potash, alum, 1 drachm each; mix and pulverize; put into a teacup half full of water; stir well and then fill up with good vinegar. Use every half hour, one, two, and four hours, as recovery progresses. The patient may swallow a little each time. Apply 1 ounce each of spirits of turpentine, sweet oil, and aqua ammonia, mixed, every hour, to the whole of the throat, and to the breast bone every four hours, keeping flannel to the part.

Worm Lozenges.—Powdered lump sugar, 10 ounces; starch, 5 ounces; mix with mucilage; and to every ounce add 12 grains calomel, divided into 20 grain lozenges. Dose, two to six.

Soothing Syrup.—Take 1 pound of honey; add 2 tablespoonfuls of paregoric, and the same of oil of anise seed; add enough water to make a thick syrup, and bottle. For children teething, dose, teaspoonful occasionally.

Infants' Syrup.—This syrup is made thus: 1 pound best box raisins; 1-2 ounce anise seed; 2 sticks licorice; split the raisins, pound the anise seed, and cut the licorice fine; add to it 3 quarts of rain water, and boil down to two quarts. Feed three or four times a day, as much as the child will willingly drink. The raisins are to strengthen, the anise is to expel the wind, and the licorice as a physic.

Swaim's Vermifuge.—Wormseed, 2 ounces; valerian, rhubarb, pink-root, white agaric, of each 1 1-2 ounces; boil in sufficient water to yield 3 quarts of decoction; add to it 30 drops of tansy and 45 drops of oil of cloves, dissolved in a quart of rectified spirits. Dose, 1 tablespoonful at night.

Ayer's Cherry Pectoral.—Take 4 grains of the acetate of morphia; 2 fluid drachms of tincture of bloodroot; a fluid drachm each of antimonial wine and wine of ipecacuanha, and 3 fluid ounces of syrup of wild cherry. Mix.

Brown's Bronchial Troches.—Take 1 pound of pulverized extract of licorice; 1 1-2 pounds of pulverized sugar; 4 ounces of pulverized cubebs; 4 ounces of pulverized gum arabic, and 1 ounce of pulverized extract of conium. Mix.

Russia Salve.—Take equal parts of yellow wax and sweet oil; melt slowly, carefully stirring; when cooling, stir in a small quantity of glycerine. Good for all kinds of wounds, etc.

To Extract Teeth with Little or no Pain.—Tincture of

aconite, chloroform, and alcohol, of each 1 ounce. Mix. Moisten two pledgets of cotton with the liquid, and apply to the gums on each side of the tooth to be extracted, holding them in their place with pliers or other instruments for from five to ten minutes, rubbing the gum freely inside and out.

Tooth Wash.—To Remove Blackness.—Pure muriatic acid, 1 ounce; water, 1 ounce; honey, 2 ounces. Mix. Take a tooth brush and wet it freely with the preparation, and briskly rub the black teeth, and in a moment's time they will be perfectly white; then immediately wash out the mouth with water, that the acid may not act upon the enamel of the teeth.

Compound Extract of Buchu.—Buchu leaves, 1 pound; boiling distilled water, 3 gallons; boil the leaves in 2 gallons of the water down to 6 quarts; then boil it again in the remaining water till reduced to 2 quarts. Evaporate the mixed liquors down to 6 pints, and add 1 quart strong sage tea, 2 drachms bicarbonate of potassa, 2 drachms tincture of cannabis Indica, 5 ounces rectified spirits, 2 ounces balsam of copabia, and Harlem oil. Bottle.

New Method of Embalming.—Mix together 5 pounds of dry sulphate of alumine, 1 quart of warm water, and 100 grains of arsenious acid. Inject three or four quarts of this mixture into all the vessels of the human body. This applies as well to all animals, birds, fishes, etc. This process supercedes the old and revolting mode, and has been introduced into the great anatomical schools of Paris.

Hair Dye.—No. 1.—Take galic acid, 1-2 ounce; alcohol, 8 ounces; soft water, 16 ounces. Put the acid in the alcohol, then add the water.

No. 2.—Crystalized nitrate of silver, 1 ounce; strongest ammonia, 3 ounces; gum arabic, 1-2 ounce; soft water, 6 ounces. Put the silver in the ammonia; do not cork till it is dissolved; dissolve the gum in the water, then mix, and it is ready for use.

Keep Nos. 1 and 2 in separate bottles, and apply each alternately to the hair. Be particular to cleanse the hair before applying the dye.

Another.—Nitrate of silver, 11 drachms; nitric acid, 1 drachm; distilled water, 1 pint; sap green, 3 drachms; gum arabic, 1 drachm. Mix.

Another.—Nitric acid, 1 drachm; nitrate of silver, 10 drachms; sap green, 9 drachms; mucilage, 5 drachms; distilled water, 37 1-2 fluid ounces.

Hair Invigorator.—Bay rum, 2 pints; alcohol, 1 pint; castor-oil, 1 ounce; carbonate of ammonia, 1-2 ounce; tincture of cantharides, 1 ounce. Mix them well. This compound will promote the growth of the hair and prevent it from falling out.

Razor-Strop Paste.—Wet the strop with a little sweet oil, and apply a little flour of emery evenly over the surface.

Oriental Cold Cream.—Oil of almonds, 4 ounces; white wax and spermaceti, of each, 2 drachms; melt and add rose water, 4 ounces; orange-flower water, 1 ounce. Used to soften the skin. Apply as the last.

Shaving Cream.—White wax, spermaceti, and almond oil, of each, 1-4 ounce; melt, and while warm beat in two squares of Windsor soap, previously reduced to a paste with rose water.

Circassian Cream.—Take 2 ounces of perfectly fresh suet, either of mutton or venison; 3 ounces of olive oil; 1 ounce of gum benzoin in powder; and 1-4 ounce of alkanet root. Put the whole into a jam jar, which, if without a lid, must be tied over with bladder, and place the jar in a sauce pan containing boiling water, at the side of the fire. Digest for a whole day, then strain away all that is fluid through fine muslin, and stir till nearly cold. Add, say 1 drachm of essence of almonds roses, bergamot, or any other perfume desired.

Yankee Shaving Soap.—Take 3 pounds of white bar soap, 1 pound of Castile soap, 1 quart of rain water, 1-2 pint of beef's gall, 1 gill spirits of turpentine. Cut the soap into thin slices, and boil five minutes after the soap is dissolved; stir while boiling; scent with oil of rose or almonds. If wished to color it, use 1-2 ounce vermillion.

Freckle Cure.—Take 2 ounces of lemon juice, or 1-2 drachm of powdered borax, and 1 drachm of sugar; mix together, and let them stand in a glass bottle for a few days, then rub on the face occasionally.

Hair Restorative.—Sugar of lead, borax, and lac-sulphur, of each, 1 ounce; aqua ammonia, 1-2 ounce; alcohol, 1 gill. These articles are to stand mixed for 14 hours; then add bay rum, 1 gill; fine table salt, 1 tablespoonful; soft water, 3 pints; essence of bergamot, 1 ounce. This preparation gives a splendid glossy appearance to the hair, turns gray hair to a dark color, and restores the hair when common baldness sets in. When the hair is thin or bald, apply twice a day with a hard brush, working into the roots of the hair. For gray hair, once a day is sufficient.

Barber's Shampoo Mixture.—Soft water, 1 pint; sal soda, 1 ounce; cream tartar, 1-4 ounce. Apply thoroughly to the hair.

Febrifuge Wine.—Quinine, 25 grains; water, 1 pint; sulphuric acid, 15 drops; epsom salts, 2 ounces; color with tincture of red sanders. Dose, a wine glass, three times a day. This is a world-renowned medicine.

Barrell's Indian Liniment.—Alcohol, 1 quart; tincture of capsicum, 1 ounce; oils of origanum, sassafras, pennyroyal, and hemlock, of each, 1-2 ounce. Mix. More than $70,000 have been cleared by the sale of this medicine during the last twelve years in the Western States.

Paregoric.—Best opium, 1-2 drachm; dissolve it in about 2 tablespoonfuls of boiling water; then add benzoic acid, 1-2 drachm; oil of anise, 1-2 a fluid drachm; clarified honey, 1 ounce; camphor gum, 1 scruple; alcohol, 76 per cent., 11 fluid ounces; distilled water, 4 fluid ounces. Macerate (keep warm) for two weeks. Dose, for children, 5 to 20 drops; adults, 1 to 2 teaspoonfuls.

Cough Syrup.—Syrup of squills, 2 ounces; tartarized antimony, 8 grains; sulphate of morphine, 5 grains; pulverized gum arabic, 1-4 ounce; honey, 1 ounce; water, 1 ounce. Mix. Dose for an adult, one small teaspoonful; repeat in half an hour if it does not relieve. Child in proportion.

Camphor Ice.—Spermaceti, 1 1-2 ounce; gum camphor, 3-4 ounce; oil of sweet almonds, 4 teaspoonfuls. Set on stove in an earthen dish till dissolved; heat just enough to dissolve it. While warm, put into small moulds, if desired to sell; then paper, and put into tinfoil. Used for chaps on hands or lips.

Imperial Drops for Gravel and Kidney Complaints.—Oil of origanum, 1 ounce; oil of hemlock, 1-4 ounce; oil of sassafras, 1-4 ounce; oil of anise, 1-2 ounce; alcohol, 1 pint. Mix. Dose, from 1-2 to 1 teaspoonful three times a day in sweetened water, will soon give relief when constant weakness is felt across the small of the back, as well as gravelly affections causing pain about the kidneys.

Positive Cure for Gonorrohœa.—Liquor of potass, 1-2 ounce; bitter apple, 1-2 ounce; spirits of sweet nitre, 1-2 ounce; balsam of copabia, 1-2 ounce; best gum, 1-4 ounce. To use, mix with peppermint water. Take 1-2 teaspoonful three times a day. Cure certain in nine days.

Celebrated Pile Ointment.—Take carbonate of lead, 1-2 ounce; sulphate of morphia, 15 grains; stramonium ointment, 1

ounce; olive oil, 20 drops. Mix, and apply three times a day, or as the pain may require.

Sweating Drops.—Ipecac, saffron, boneset and champhor gum, of each, 3 ounces; opium, 1 ounce; alcohol, 2 quarts. Let stand two weeks and filter. A teaspoonful in a cup of hot sage or catnip tea every hour until free perspiration is induced; excellent in colds, fevers, inflammations, etc. Bathe the feet in hot water at the same time.

Syrup for Consumptives.—Of tamarac bark, take from the tree without rossing, 1 peck; spikenard root, 1-2 pound; dandelion root 1-4 pound; hops, 2 ounces. Boil these sufficient to get the strength in two or three gallons of water; strain and boil down to one gallon; when blood warm, add three pounds of best honey, and 3 pints of best brandy; bottle and keep in a cool place. Dose, drink freely of it three times per day before meals, at least a gill or more; cure very certain.

Female Complaints.—Pills to Promote Menstrual Secretion.—Take pills of aloes and myrrh, 4 drachms; compound iron pills, 280 grains. Mix, and form into 100 pills. Dose 2, twice a day.

For Obstructed Menstruation.—Sulphate of iron, 60 grains; potassa (sub. carb.), 60 grains; myrrh, 2 drachms. Make them into three and one-half-grain pills; two to be taken three times a day, in the absence of fever. For painful menstruation, take pulverized rhei, 2 drachms; pulverized jalap, 2 drachms; pulverized opium, 2 drachms; syrup of poppies to mix. Divide into 200 pills, and take night and morning. To check immoderate flow: Tincture of ergot, 1 ounce; liquor of ammonia, 3 drachms. Mix. Dose teaspoonful in water three times a day.

Stimulant.—In Low Fevers and After Uterine Hæmorrhages.—Best brandy and cinnamon water, of each 4 fluid ounces; the yolks of 2 eggs, well beaten; loaf sugar, 1-2 ounce; oil of cinnamon, 2 drops. Mix. Dose, from one-half to one (fluid) ounce, as often as required. This makes both meat and drink. Of course, any other flavoring oils can be used, if preferred, in place of the cinnamon.

For Female Complaints.—One of the best laxative pills for female complaints is macrotin and rhubarb, each 10 grains; extract of hyoscyamus, 10 grains; Castile soap, 40 grains. Scrape the soap, and mix well together, forming into common sized pills with gum solution. Dose, one pill at bedtime, or sufficiently often to keep the bowels in a laxative state.

Anodyne for Painful Menstruation.—Extract of stramonium and sulphate of quinine, each 16 grains; macrotin, 8

grains; morphine, 1 grain. Make into 8 pills. Dose, one pill, repeating once or twice only, forty to fifty minutes apart, if the pain does not subside before this time. Pain must subside under the use of this pill, and costiveness is not increased.

Powder for Excessive Flooding.—Gums kino and catechu, each 1 drachm; sugar of lead and alum, each 1-2 drachm. Pulverize all and thoroughly mix, then divide into 7 to 10 grain powders. Dose, one every two or three hours until checked, then less often merely to control the flow.

Injection for Leucorrhea.—When the glairy mucus discharge is present, prepare a tea of hemlock inner bark and witch hazel (often called spotted alder) leaves and bark, have a female syringe large enough to fill the vagina, and inject the tea, twice daily; and occasionally in bad cases, say twice a week, inject a syringe of the following composition:

For Chronic Female Complaints.—White vitriol and sugar of lead, each 1-8 ounce; common salt, pulverized alum, and loaf sugar, of each, 1-2 drachm; soft water, 1 pint. Inject as above.

For Prolapsus Uteri, or Falling of the Womb.—Not only the cheapest but the best support will be found to be a piece of firm sponge, cut to a proper size to admit, when damp, of being pressed up the vagina to hold the womb in its place. The sponge should have a stout piece of small cord sewed two or three times through its centre up and down, and left sufficiently long to allow its being taken hold of to remove the sponge once a day, or every other day at the farthest, for the purpose of washing, cleaning, and using the necessary injections; and this must be done while the patient is lying down, to prevent the womb from again falling or prolapsing. After having injected some of the above tea, wet the sponge in the same, and introduce it sufficiently high to hold the womb in its place. If pain is felt about the head, back, or loins, for a few days before the menses appear, prepare and use the following:

Uterine Hæmorrhages.—Unfailing cure. Sugar of lead, 10 grains; ergot, 10 grains; opium, 3 grains; epicac, 1 grain; All pulverized and well mixed. Dose, 10 to 12 grains, given in a little honey or syrup. In very bad cases after childbirth, it might be repeated in thirty minutes, or the dose increased to 15 or 18 grains; but in cases of rather profuse masting, repeat it once at the end of three hours, or as the urgency of the case may require.

In every case of female debility make a liberal use of iron, as the want of iron in the system is often the cause of the trouble. Mix fine iron filings with as much ground ginger.

Dose, half of a teaspoonful three times daily in a little honey or molasses; increase or lessen the dose to produce a blackness of the stools. Continue this course until well.

Nerve and Bone Liniment.—Beef's gall, 1 quart; alcohol, 1 pint; volatile liniment, 1 pound; spirits of turpentine, 1 pound; oil origanum, 4 ounces; aqua ammonia, 4 ounces; tincture of cayenne, 1-2 pint; oil of amber, 3 ounces; tincture of Spanish flies, 6 ounces. Mix well.

Positive Cure for Ague Without Quinine.—Peruvian bark, 2 ounces; wild cherry tree bark, 1 ounce; cinnamon, 1 drachm; capsicum, 1 teaspoonful; sulphur, 1 ounce; port wine, 2 quarts. Let it stand two days. Buy your Peruvian bark and pulverize it yourself, as it is often adulterated otherwise. Dose, a wine-glass full every two or three hours after fever is off, then two or three per day till all is used. A certain cure. Before taking the above, cleanse the bowels with a dose of epsom salts, or other purgative.

Green Mountain Salve.—For rheumatism, burns, pains in the back or side, &c. Take 2 pounds of rosin; burgundy pitch, 1-4 pound; beeswax, 1-4 pound; mutton tallow, 1-4 pound. Melt slowly. When not too warm, add oil hemlock, 1 ounce; balsam fir, 1 ounce; oil of origanum, 1 ounce; oil of red cedar, 1 ounce; Venice turpentine, 1 ounce; oil of wormwood, 1 ounce; verdigris, 1-2 ounce. The verdigris must be finely pulverized and mixed with the oils; then add as above, and work in cold water like wax till cold enough to roll; rolls five inches long, one inch in diameter, sell for 25 cents.

English Remedy for Cancer.—Take chloride of zinc, blood root pulverized, and flour, equal quantities of each, worked into a paste and applied. First spread a common sticking-plaster, much larger than the cancer, cutting a circular piece from the centre of it a little larger than the cancer, applying it, which exposes a narrow rim of healthy skin; then apply the cancer plaster, and keep it on 24 hours. On removing it, the cancer will be found to have been burned into, and appears the color of an old shoe sole, and the rim outside will appear white and parboiled, as if burned by steam. Dress with slippery-elm poultice until suppuration takes place, then heal with any common salve.

Charcoal, a Cure for Sick Headache.—It is stated that two teaspoonfuls of finely powdered charcoal, drank in half a tumbler of water will, in less than fifteen minutes, give relief to the sick headache, when caused, as in most cases it is, by superabundance of acid on the stomach.

Felons.—If Recent, to Cure in Six Hours.—Venice turpentine, 1 ounce; and put it into half a teaspoonful of water,

and stir with a rough stick until the mass looks like a candied honey; then spread a good coat on a cloth, and wrap around the finger. If the case is only recent it will remove the pain in 6 hours.

Felon Salve.—A salve made by burning one tablespoonful of copperas, then pulverizing it and mixing with the yolk of an egg, is said to relieve the pain, and cure the felon in 24 hours; then heal with cream two parts, and soft soap one part. Apply the healing salve daily after soaking the part in warm water.

Felon Ointment.—Take sweet oil, 1-2 pint, and stew a three-cent plug of tobacco in it until the tobacco is crisped; then squeeze it out and add red lead, 1 ounce; and boil until black; when a little cool add pulverized camphor gum, 1 ounce.

Warts and Corns.—To Cure in Ten Minutes.—Take a small piece of potash, and let it stand in the open air until it slacks, then thicken it to a paste with pulverized gum arabic, which prevents it from spreading where it is not wanted.

Liniment for Old Sores.—Alcohol, 1 quart; aqua ammonia, 4 ounces; oil of origanum, 2 ounces; camphor gum, 2 ounces; opium, 2 ounces; gum myrch, 2 ounces; common salt, 2 tablespoonfuls. Mix, and shake occasionally for a week.

Liniment.—Good Samaritan.—Take 98 per cent. alcohol, 2 quarts, and add to it the following articles: Oil of sassafras, hemlock, spirits of turpentine, tincture of cayenne, catechu, guaiac, (guac) and laudanum, of each 1 ounce; tincture of myrrh, 4 ounces; oil of origanum, 2 ounces; oil of wintergreen, 1-2 ounce; gum camphor, 2 ounces; and chloroform, 1 1-2 ounces. This is one of the best applications for internal pains known; it is superior to any other enumerated in this work.

Electro-Magnetic Liniment.—Best alcohol, 1 gallon; oil of amber, 8 ounces; gum camphor, 8 ounces; Castile soap, shaved fine, 2 ounces; beef's gall, 4 ounces; ammonia, 3 F's strong, 12 ounces. Mix, and shake occasionally for 12 hours, and it is fit for use. This will be found a strong and valuable liniment.

Great London Liniment.—Take chloroform, olive oil, and aqua ammonia, of each 1 ounce; acetate of morphia, 10 grains. Mix and use as other liniments. Very valuable.

Ointments.—For Old Sores.—Red precipitate, 1-2 ounce; sugar of lead, 1-2 ounce; burnt alum, 1 ounce; white vitriol, 1-4 ounce, or a little less; all to be very finely pulverized; have mutton tallow made warm, 1-2 pound; stir all in, and stir until cool.

Judkins Ointment.—Linseed oil, 1 pint; sweet oil, 1 ounce; and boil them in a kettle on coals for nearly 4 hours, as warm as you can; then have pulverized and mixed borax, 1-2 ounce; red lead, 4 ounces; and sugar of lead, 1 1-2 ounce; remove the kettle from the fire, and thicken in the powder; continue the stirring until cooled to blood-heat, then stir in 1 ounce of spirits of turpentine; and now take out a little, letting it get cold, and, if not then sufficiently thick to spread upon thin, soft linen, as a salve, you will boil again until this point is reached. It is good for all kinds of wounds, bruises, sores, burns, white swellings, rheumatisms, ulcers, sore breasts; and, even when there are wounds on the inside, it has been used with advantage by applying a plaster over the part.

Green Ointment.—Honey and bees-wax, each 1-2 pound; spirits of turpentine, 1 ounce; wintergreen oil and laudanum, each 2 ounces; verdigris, finely pulverized, 1-4 ounce; lard, 1 1-2 pounds; mix by a stove fire, in a copper kettle, heating slowly.

Mead's Salt-Rheum Ointment.—Aqua fortis, 1 ounce; quicksilver, 1 ounce; good hard soap dissolved so as to mix readily, 1 ounce; prepared chalk, 1 ounce; mixed with 1 pound of lard; incorporate the above by putting the aqua fortis and quicksilver into an earthen vessel, and, when done effervescing, mix with the other ingredients, putting the chalk in last, add a little spirits of turpentine, say 1-2 tablespoonful.

Itch Ointment.—Unsalted butter, 1 pound; burgundy pitch, 2 ounces; spirits of turpentine, 2 ounces; red precipitate, pulverized, 1 1-4 ounces; melt the pitch and add the butter; stirring well together; then remove from the fire, and, when a little cool, add the spirits of turpentine, and lastly the precipitate, and stir until cold.

Jaundice.—Dr. Peabody's Cure.—In its Worst Forms.—Red iodide of mercury, 7 grains; iodide of potassium, 9 grains; aqua dis (distilled water) 1 ounce; mix. Commence by giving 6 drops three or four times a day, increasing 1 drop a day until 12 or 15 drops are given at a dose. Give in a little water, immediately after meals. If it causes a griping sensation in the bowels, and fullness in the head, when you get up to 12 or 15 drops, go back to 6 drops, and up again as before.

Inflammatory Rheumatism. — Wright's Cure.—Sulphur and salt-petre, of each 1 ounce; gum guaiac, 1-2 ounce; colchicum root, or seed, and nutmegs, of each 1-4 ounce; all to be pulverized and mixed with simple syrup, or molasses, 2 ounces. Dose, 1 teaspoonful every two hours until it moves the bowels rather freely; then 3 or 4 times daily until cured.

Asthma Remedies.—Elecampane, angelica, confrey, and spikenard roots with hoarhound tops, of each 1 ounce; bruise

and steep in honey, 1 pint. Dose, a tablespoonful, taken hot every few minutes until a cure is affected.

ANOTHER.—Oil of tar, 1 drachm; tincture of veratum viride, 2 drachms; simple syrup, 2 drachms; mix. Dose, for adults, 15 drops 3 or 4 times daily. Iodide of potassium has cured a bad case of asthma by taking 5 grain doses, 3 times daily. Take 1-3 ounce, and put into a phial, and add 32 teaspoonful of water; then 1 teaspoonful of it will contain the 5 grains, in which put 1-2 gill more water, and drink before meals.

Dropsy Pills.—Jalap, 50 grains; gamboge, 30 grains; podophyllin, 20 grains; elatarium, 12 grains; aloes, 30 grains; cayenne, 35 grains; Castile soap, shaved and pulverized, 20 grains; croton oil, 90 drops; powder all finely, and mix thoroughly; then form into a pill mass, by using a thick mucilage made of equal parts of gum arabic and gum tragacanth, and divide in 3 grain pills. Dose: 1 pill every 2 days for the first week; then every 3 or 4 days, until the water is evacuated by the combined aid of the pill with the alum syrup. This is a powerful medicine, and will thoroughly accomplish its work.

Eclectic Liver Pills.—Podophyllin, 10 grains; leptandrin, 20 grains; sanguinarian, 10 grains; extract of dandelion, 20 grains; formed into 20 pills by being moistened a little with some essential oil, as cinnamon, peppermint, etc. Dose: In chronic diseases of the liver, take a pill at night for several days, or 2 may be taken at first to move the bowels; then 1 daily.

Positive Cure for Hydrophobia.—The dried root of elecampane, pulverize it, and measure out 9 heaping tablespoonfuls, and mix it with 2 or 3 teaspoonfuls of pulverized gum arabic; then divide into 9 equal portions. When a person is bitten by a rabid animal, take one of these portions, and steep it in 1 pint of new milk, until nearly half the quantity of milk is evaporated; then strain, and drink it in the morning, fasting for four or five hours after. The same dose is to be repeated three mornings in succession, then skip three, and so on till the 9 doses are taken.

The patient must avoid getting wet, or the heat of the sun, and abstain from high-seasoned diet, or hard exercise, and, if costive, take a dose of salts. The above quantity is for an adult; children will take less according to age.

Eye Preparations.—EYE WATER.—Table salt and white vitriol, of each 1 tablespoonful; heat them up on copper or earthen until dry; the heating drives off the acrid or biting water, called the water of crystalization, making them much milder in their action; now add them to soft water, 1-2 pint; putting in white sugar, 1 tablespoonful; blue vitriol, a piece the size of a common

pea. If it should prove too strong in any case, add a little more soft water to a phial of it. Apply it to the eyes three or four times daily.

India Prescription for Sore Eyes.—Sulphate of zinc, 3 grains; tincture of opium (laudanum) 1 drachm; rose water, 2 ounces; mix. Put a drop or two in the eye, two or three times daily.

Another.—Sulphate of zinc, acetate of lead, and rock salt, of each, 1-2 ounce; loaf sugar, 1 ounce; soft water, 12 ounces; mix without heat, and use as other eye waters.

If sore eyes shed much water, put a little of the oxide of zinc into a phial of water; and use it rather freely. It will soon cure that difficulty.

Copperas and water has cured sore eyes of long standing; and used quite strong, it makes an excellent application in erysipelas.

Indian Eye Water.—Soft water, 1 pint; gum arabic, 1 ounce; white vitriol, 1 ounce; fine salt, 1-2 teaspoonful; put all into a bottle, and shake until dissolved. Put into the eye just as you retire to bed.

Egyptian Cure for Cholera.—Best Jamaica ginger root bruised, 1 ounce; cayenne, 2 teaspoonfuls. Boil all in one quart of water to one-half pint, and add loaf sugar to form a thick syrup. Dose: One tablespoonful every fifteen minutes, until vomiting and purging ceases; then follow up with a blackberry tea.

King of Oils, for Neuralgia and Rheumatism.—Burning fluid, 1 pint; oils of cedar, hemlock, sassafras and origanum, of each, 2 ounces; carbonate of ammonia, pulverized, 1 ounce. Mix. Directions.—Apply freely to the nerve and gums around the tooth; and to the face in neuralgic pains, by wetting brown paper and laying on the parts, not too long, for fear of blistering. To the nerves of teeth by lint.

Neuralgia. — Internal Remedy. — Sal-ammoniac, 1-2 drachm; dissolve in water, 1 ounce. Dose, one tablespoonful every 3 minutes for 20 minutes, at the end of which time, if not before, the pain will have disappeared.

Wens.—To Cure.—Dissolve copperas in water to make it very strong; now take a pin, needle, or sharp knife, and prick or cut the wen in about a dozen places, just sufficient to cause it to bleed; then wet it thoroughly with the copperas water daily.

POISONS.

Animal Poisons.—In the first class is poisoning from certain shellfish, such as mussels, lobsters, etc., the eating of which is sometimes followed by an eruption of nettle-rash over the whole body, which causes it to have a swollen, bloated appearance, and produces difficulty of breathing, accompanied with giddiness, nausea, stomach-ache, and great thirst.

TREATMENT.—If commenced within two or three hours after the appearance of the symptoms, an emetic of mustard, salt, and warm water, should be given. The emetic should be compounded thus:

Mustard, 1 teaspoonful.
Common salt, 1 teaspoonful.
Warm water, 1 tumblerful.
Mix, and take as a draught.

Should, however, a longer time have elapsed, purgatives, such as a teaspoonful of castor-oil, or half an ounce of epsom salts, should be administered and repeated until full action is obtained. Stimulants, such as salvolatile, or aromatic spirits of ammonia, and ether, may also be administered if there be much depression.

The following form would be a useful draught: Take of nitrous spirits of ether, 30 minims; spirits of salvolatile, 30 minims; water, to make up 1 1-2 ounces. Repeat the dose every two or three hours until the system rallies.

Vegetable Poisons.—Of these, the most commonly met with are the aconite or monkshood, belladonna or deadly nightshade; the hellebore, hemlock, henbane, foxglove, laburnum, yew, colchicum, or meadow saffron, and mushrooms, all of which are indigeneous to this country. Others, such as opium, Indian hemp, nux vomica, and gamboge, are not native here.

Among vegetable poisons should be included oxalic acid, and that most deadly of all poisons, prussic acid, which is found in undiluted "almond flavoring," used for culinary purposes.

SYMPTOMS.—Vegetable poisons have many features in common, thus they are strongly acrid and narcotic, or depressing, causing drowsiness, feebleness of pulse, vomiting, purging, griping.

Under the following enumeration, the symptoms peculiar to each will be found, together with their appropriate treatment:

Aconite (*Monkshood*).—SYMPTOMS.—A sensation of burning, tingling or numbness, in the mouth and throat. Giddiness, loss of power to stand firmly, pain in the region of the stomach, frothing at the mouth, vomiting and purging. The pupils are

dilated, the skin cold and livid, the breathing becomes difficult. In some cases delirium and paralysis follow.

TREATMENT.—An emetic should immediately be given, such as a mixture of mustard, salt, and warm water, thus: Mustard, 1 teaspoonful; common salt, 1 teaspoonful; warm water, a tumblerful. Or, sulphate of zinc, 20 grains; water, 1 ounce. Given every half hour until the stomach has been emptied of the poison. Acidulous fluids, such as vinegar and water, and cordials should be given freely. External warmth should be kept up by mustard plasters, hot water bottles to the feet and friction to the surface.

DISTINCTION.—The root of this plant is often mistaken for horseradish which it closely resembles; therefore great care should be taken not to allow the two plants to grow in the same garden. The leaves and seeds of the plant are also poisonous.

Belladonna (*Deadly Nightshade*).—The leaves, berries, stalks—or extract or tincture made from these—are most commonly met with as a cause of poison.

SYMPTOMS.—Heat and dryness of mouth, a feeling of tightness in the throat. Nausea, vomiting, giddiness, indistinct or double sight, intense excitement, delirium of a peculiar kind, the patient twists himself round and round, butts against the wall with his head, and performs various other antics. These are followed by heaviness and lethargy.

TREATMENT.—Begin by giving freely a mixture of about one part of vinegar to two of water. Then cause evacuation of the stomach by means of emetics, such as mustard, 1 teaspoonful; common salt, 1 ditto; warm water, a tumblerful. Taken at a draught. Or, sulphate of zinc, 20 grains; water, 1 ounce. Dissolved, and taken as a draught. Promote vomiting by warm water slightly acidulated with vinegar. The bowels should be emptied by injections of castor oil.

Digitalis Purpurea (*Foxglove*).—SYMPTOMS. — Vomiting, purging, accompanied with severe pain in the stomach. This is followed by a state of lethargy, during which the patient will sleep for hours; this, again, is followed by convulsions. The pupils are dilated and insensible to the stimulating effect of light; the pulse becomes small and irregular; and, should the dose have been large, and the proper measures not adopted, coma or insensibility of a severe kind will rapidly set in, and be followed by death.

TREATMENT.—A free use of emetics (see under Hemlock) should be pursued. Drinks containing tannic acid, such as

strong tea and infusion of gall-nuts, should be given; if the prostration be great, brandy should be given freely.

All the parts of this plant are poisonous. They owe their poisonous properties to an active principle called *digitalin.* This, in combination with tannic acid, is rendered innocuous; hence the reason for its administration in cases of poisoning.

Gamboge (*Cambogia*).—SYMPTOMS.—Violent vomiting, severe pain in the stomach and excessive purging, followed by great prostration of strength.

TREATMENT.—Carbonate of potash should be given as follows: Carbonate of potash, 20 grains; mucilage, or solution of gum, 1-2 ounce; water to make up 1 ounce. Mix, and take every hour until the purging has stopped. When this is the case, and the poison is supposed to have been evacuated, give the following every half hour: Tincture of opium, 10 drops; water, 1 ounce. Mix. Gamboge is a gum resin obtained from the Garcinia Morella, a native of Spain. It is but little used in legitimate medicine, on account of its violent and uncertain action. Quack pills contain it in very variable quantities.

Hellebores, the.—The Green Hellebore (*Helleborus virids*). The White Hellebore (*Veratrum album*). The Black Hellebore, or Christmas rose (*Helleborus niger*). The Fœtid Hellebore (*Helleborus Fœtida*). All of these are powerful poisons, the white hellebore especially so.

SYMPTOMS.—Vomiting, purging, giddiness, dilation of the pupils, convulsions, insensibility, great heat of the throat, and tightness, with severe pain in the stomach.

TREATMENT.—Vomiting should be excited by large doses of solution of gum, and other mucilaginous fluids, such as milk, white of egg, etc., and injections of the same materials should be thrown up into the bowel. Coffee should then be given freely, and acidulous fluids and camphor-water. The roots and leaves of this plant are both poisonous, the roots especially.

Hemlock (*Conium Maculatum*).—SYMPTOMS.—This plant attacks the muscular power, and causes paralysis of the limbs, sickness, pain in the head, drowsiness, and sometimes it so affects the muscles of respiration as to cause death.

TREATMENT.—The stomach should be evacuated by some powerful emetic, such as the following: Sulphate of zinc, 20 grains; dissolved in water, a wineglassful. Or, mustard, 1 teaspoonful; common salt, 1 teaspoonful; water, a tumblerful. After this cold water should be applied to the head. Vinegar and water (see under Deadly Nightshade) should be administered. The poisonous properties of this plant reside in the

leaves, which somewhat resemble parsley, for which they have occasionally been mistaken. The seeds and the root are also poisonous.

Henbane (*Hyoscyamus*).—SYMPTOMS.— Vomiting, double vision, dilatation of the pupils, sleepiness, loss of muscular power, a peculiar tremulous motion of the limbs, flushing of the countenance, heat and weight of head, giddiness, fullness of the pulse and general excitement. If the dose has been a large one, the symptoms will be aggravated; there will be loss of speech, delirium, coma, coldness of the surface, and jerkings of the muscles.

TREATMENT.—As soon as possible empty the stomach by emetics, and give acidulous drinks; if, however, the poison has entered the system, purgatives must be given. The seeds are the most poisonous, the leaves next, and the roots last.

Indian Hemp (*Cannabis Indica*). — HASCHISCH. — SYMPTOMS.—Much the same as those of opium, but are of a much more pleasant nature to the patient, being associated with delightful dreams and visions.

TREATMENT.—Much the same as in the case of poisoning by opium.

Cases of poisoning by this plant are very rarely met with in America. In hot climates, however, it is frequently met with, especially in India.

Laburnum (*Cyitalisus Laburnum*).—SYMPTOMS.—Pain in the stomach, followed by vomiting and severe convulsions if the dose has been a large one. There is also shivering, great feebleness, and severe purging.

TREATMENT.—The vomiting should be encouraged by mucilage, milk, white of an egg, flour and water. Should the feebleness be very great, cordials and brandy should be given in repeated and small doses. The bark and seeds of this plant are poisonous, and owe their deleterious properties to an active principle called Cytisine.

Meadow Saffron (*Colchicum autumnale*).— SYMPTOMS.— A burning pain in the gullet and stomach, violent vomiting, and sometimes bilious purging.

TREATMENT.—Give some mild emetic, thus: Ipecacuanha wine, one-half ounce; honey, 1 tablespoonful; milk, a teacupful. Stir up and mix thoroughly, and let the patient take it at a draught. This should be repeated every quarter of an hour till vomiting sets in. Of course the dose of ipecacuanha wine should be smaller for children, one-half or one-fourth of the above quantity being ample for a child under five years old.

Then give opium as follows (to adults only): Powdered opium, 3 grains; confection of dog rose, sufficient to make a small mass with the opium. Divide this into six pills, and let the patient have one every four hours, until the symptoms of poisoning abate. Or, tincture of opium, 1 fluid drachm; water, to six fluid ounces. Mix. Two tablespoonfuls to be taken every two hours.

Mushrooms (*Fungi*).—SYMPTOMS.—Pain in the stomach accompanied with vomiting, giddiness, drowsiness, dimness of sight, and debility. The patient appears to be intoxicated.

TREATMENT.—This cannot be better expressed than in the terse and plain terms of Professor Taylor. They are: "The free use of emetics and castor oil."

Nux Vomica (*Strychnine*). — SYMPTOMS. — An intensely bitter taste in the mouth. Tipsy manner, sickness, headache, jerking of the arms and legs, and twitching of the body; lock-jaw, great difficulty in breathing, with intense pain in the chest, and a sense of suffocation.

TREATMENT.—Evacuate the stomach and bowels. Give vinegar (see Deadly Nightshade) and other acidulous drinks. If the spasm be very severe and constant, and do not yield to the emetics, etc., then try injections of infusions of tobacco, as follows: Tobacco (shag), 30 grains; water, 8 fluid ounces. Mix, and allow to stand for half an hour, occasionally shaking. Then strain and inject into the bowel in the intervals of the spasms.

Strychnia is one of the most deadly poisons, a very small quantity being capable of killing a strong man.

Opium.—*An extract from the poppy.* (*Papaver Somnifera*). —SYMPTOMS.— Drowsiness, stupor, delirium, pallid countenance, contracted pupil, sighing, loud or snoring respiration, cold sweats, coma, and death.

TREATMENT.—Emetics of the sulphated zinc (see under Hemlock), or, if the patient be too far gone to take these, the stomach pump should be applied. The patient should on no account be allowed to sleep, but his attention should be constantly aroused. A good plan is to walk the patient rapidly and incessantly about. A tepid bath is useful for arousing the sleeping energies, and cold water should be dashed over the head at the same time. Opium is the juice of the poppy, which runs from the incisions made in the unripe fruit. Its principal properties are due to an active principle contained in it, which is called morphia. In cases of overdoses of this drug, the same treatment should be adopted.

Oxalic Acid.—SYMPTOMS.—If the dose be a large one, while it is being swallowed a hot, burning, acid taste is experienced, extending downward to the stomach; vomiting then occurs, or within a few minutes. There is a severe feeling of tightness in the throat, and sometimes delirium. When the dose is smaller the pain is less, and vomiting does not set in so soon. At times there is no vomiting, at others it alone causes death by causing exhaustion.

TREATMENT.—Some chalk and water should be immediately administered, and a quantity of water drunk to encourage vomiting. This is not often administered with a criminal intent, the taste is too strong; but it is taken sometimes in mistake for epsom salts, which it somewhat resembles.

Prussic Acid (*Hydrocyanic Acid*).—SYMPTOMS.—Pallid appearance, giddiness, great nervous prostration, loss of sight more or less complete, faintness, labored and hard respiration, loss of power of motion.

TREATMENT.—The stomach pump should be applied; or, if this is not handy, emetics, such as mustard, salt and water. (See under Hemlock). Dash cold water over the head and chest. Give salvolatile as follows: Spirits of salvolatile, 1 drachm; water, to 1 ounce. Mix. Every quarter of an hour until there is some signs of revival. Prussic acid is the most powerful poison known. This poison is often met with in the essential oil of almonds, and great care should therefore be taken in the use of this pleasant flavoring.

Yew (*Taxus baccata*).—SYMPTOMS.—Professor Taylor gives the symptoms of poisoning by this plant as follows: "Convulsions, insensibility, coma, dilated pupils, pale countenance, small pulse, and cold extremities are the most prominent; vomiting and purging are also observed among the symptoms."

TREATMENT.—As in many other vegetable, indeed it might safely be said in all poisons, vomiting should be excited, and this is best done, and perhaps in the quickest, safest manner, by an emetic of mustard, salt and water. Should the convulsions be very acute, and there be great heat of head, cold should be applied. If the pulse is very small, and the prostration of the patient is great, as soon as the stomach is thoroughly emptied, brandy should be given.

It is commonly supposed that the leaves of this plant are not poisonous when fresh, but this is erroneous. They are at all times poisonous. The berries also are very dangerous, more especially to children, as they have an agreeable taste, and look tempting. The danger of the leaves is not so much for the human race as it is for cattle, who are fond of eating them.

Mineral Poisons.—The mineral poisons are perhaps the most commonly used for criminal and suicidal purposes, and they are certainly more easily detected by chemical means than are either the vegetable or animal poisons. Science has yet found out but few certain tests for the vegetable poisons compared with the large number of accurate and easily available tests for the mineral poisons.

Perhaps the most important of this class of poisons is arsenic, as it is certainly the most fatal; others, such as antimony, copper, lead, mercury, and the acids, are in many cases very fatal, but few of these possess the power of destroying life to anything like the extent that is possessed by arsenic.

Acid, Carbolic.—The powerful odor of this acid prevents its being frequently taken accidentally, but it has been taken with suicidal intent.

Symptoms.—These are much the same as the other powerful irritant poisons. There is an intense burning in the mouth and gullet, accompanied with a feeling of tightness in the throat, vomiting of shreds of mucus, griping pain in the stomach, the lips and insides of the cheeks present a charred appearance, and, if its action be not checked, the nervous system suffers, and the organs of the senses are impaired, and death rapidly follows.

Treatment.—Albuminous fluids should be given in large doses, such as white of egg, flour and water, gruel and milk. Magnesia, and chalk and water, is used in these cases. Emetics of mustard should also be freely administered.

Acid, Hydrochloric (*Muriatic Acid. Spirits of Salt*).—Both the symptoms and treatment of a case of poisoning by this acid are given under Sulphuric Acid.

Acid, Nitric (*Aqua Fortis*).—Symptoms.—(See Sulphuric Acid.) The only difference is that nitric acid does not cause such a dark discoloration of the lips and mouth.

Treatment.—Precisely the same as under case of Sulphuric Acid.

Acid, Sulphuric (*Oil of Vitriol*).—This acts as a poison by its powerful corrosive powers. It seldom causes death by its absorption into the system, but rather by the excessive irritation and inflammation which it causes to the lining of the mouth, the gullet, and the stomach. It immediately causes the skin to have a charred appearance of a whitish hue, which gradually becomes darker and browner; it causes pain in the stomach, vomiting, and eructations of a gaseous character; great nervous depression, which is also shared by the pulse; convulsions, and death.

TREATMENT.—Give magnesia and water, or lime-water; or, should neither of these be at hand, give soap and water freely.

Antimony (*Tartar Emetic Butter of Antimony*).—SYMPTOMS.—These are very much the same as those of arsenic, with the exception that the depression, vomiting, and collapse are much more rapid, owing to the immediate action of the poison on the heart.

TREATMENT.—Should the vomiting not occur freely, it will be as well to give an emetic, and afterwards a dose of tannic acid and water, thus: Tannic acid, 10 grains; water, 1 ounce. Mix. Or, a dose of very strong tea, or infusion of gall-nuts, mixed with magnesia.

Arsenic (*Realgar or Red Arsenic, White Arsenic, Scheele's Green, Orpiment, or Yellow Arsenic*).—SYMPTOMS.—An unpleasantly strong metallic taste, a tightness in the throat, vomiting of a brown mucus character, mixed with blood, fainting, great thirst, excessive pain in the stomach, with shivering purging, the stools being very offensive and of a dark character, pulse small and rapid, great nervous prostration and delirium. Arsenic is sometimes administered in repeated small doses, and by this means is produced a state which is called "chronic arsenical poisoning." In this case, disorder of the stomach and bowels exists, but does not form such a prominent symptom as in the more acute form of this poisoning. There will be redness and smarting in the eyes, great sensibility of the skin, at times accompanied either by a rash, which consists of minute vesicles or blisters, or else by nettle-rash. There is also local paralysis—that is to say, paralysis of one particular set of muscles, accompanied, or rather preceded, by numbness and tingling in the fingers and toes. The patient loses flesh and becomes exhausted. Sometimes the skin peels off, and loss of hair occurs.

TREATMENT.—A substance termed hydrated peroxide of iron has been strongly vaunted as an antidote to arsenic. The best way to give it is to mix a tablespoonful with water, and give every five or ten minutes. Should this not be procurable, it is best to use the stomach-pump or emetics. (See under Hemlock.) Large quantities of mucilage should be given to drink, or eggs, or milk. When the worst symptoms have subsided, and the patient is out of immediate danger, he should be kept in bed, with warm poultices applied to the pit of the stomach. Small pills of one grain of opium should be given every four hours while pain continues, but no violent aperient. Arsenic is one of those poisons which, begun with very small doses, and gradually increasing them, may become almost harmless. One form of arsenic ("Scheele's green") is largely

used as a coloring for room papers. In this form it often does insidious mischief, as it separates from the paper in minute particles, and circulates freely in the air of the room as dust. This fact may be proved by submitting some of the dust which collects on bookshelves, etc., in a room thus ornamented to a few simple chemical tests, or by causing some expert to analyze it. By so doing, the inquirer will often receive satisfactory evidence of the existence of this poison, if he has not previously had some practical experience of its effects.

Copper (*Blue Vitriol. Mineral Green. Verdigris*).—SYMPTOMS.—These, again, are much the same as in arsenic, but rather less acute. It may here be stated that many alleged cases of poison by verdigris, from cooking vessels, etc., are in reality owing to bad or decomposed food. A poisonous dose of salts of copper is always followed (if the patient recovers from the first effects) by inflammation of the bowels.

TREATMENT.—Begin with the stomach-pump, or an emetic. When the stomach has been evacuated, give white of egg, flour and water, milk. The subsequent inflammation of the bowels should be treated as described under arsenic.

Lead (*White Lead. Sugar of Lead*).—SYMPTOMS.—This also causes many of the symptoms described under arsenic, when taken in a large quantity; but there is a particular form of disease called lead colic, which particularly affects workers in lead (see colic); these people are also subject to a form of paralysis (see paralysis).

TREATMENT.—When taken in a large dose, give an emetic of sulphur of zinc or copper (see hemlock). If the pain in the stomach be severe, small doses of tincture of opium, about 10 minims, should be given at short intervals, combined with sulphate of magnesia.

Mercury (*Corrosive Sublimate. Calomel. White Precipitate*).—SYMPTOMS.—Intense metallic taste in the mouth, pain in the stomach, purging, vomiting, etc.; in fact, the symptoms of nearly all metallic poisons are similar. There are, of course, certain peculiarities belonging to each, and that belonging to mercury is the largely increased flow of saliva, commonly called "salivation," which almost invariably follows a poisonous dose of mercury in any of its forms. The period which elapses between the taking of the poison and appearance of the salivation, varies from a few hours to some days.

TREATMENT.—An emetic of sulphate of zinc or copper (as under hemlock) should be given in white of egg, mixed with milk or water, milk, and flour and water in large draughts. When the salivation sets in, the following will be found useful

when in conjunction with astringent gargles: Iodide of potassium, 24 grains; tincture of bark, 1 ounce; water, to 8 ounces. Mix, and take two tablespoonfuls three times a day. A good form of an astringent gargle is as follows: Alum, 30 grains; water, to 4 ounces. Mix, and use about a tablespoonful as a gargle every three or four hours.

Ammonia.—SYMPTOMS.—Pungent acrid odor, hot taste, stomach-ache, followed by convulsions, delirium, and death.

TREATMENT.—Vinegar and water in large doses, lemon juice and olive oil. For any other of the alkalies, soda or potash, in their caustic forms, the same treatment should be pursued.

Chloride of Zinc.—SYMPTOMS.—Pain of a burning kind in the throat, nausea and vomiting, griping pains in the stomach, pallor and coldness, the legs are drawn up, and there are appearances of collapse.

Alkalies.—The strong or concentrated preparation acts with extreme corrosive violence on the mouth, gullet, and stomach. Should the action of this poison be further continued, it will be found that it affects the nervous system. This will be demonstrated by the patient's sight becoming dim, and the power of taste and smell less acute than it is normally—by extreme depression, syncope, and death.

TREATMENT.—Milk and white of egg should be given freely, and emetics of mustard and warm water, combined with flour or oatmeal.

Baths and Bathing.—In infancy, bathing or washing at least twice a day is necessary to preserve the skin in a healthy condition. In so doing, however, care must be taken that the surface of the body be not chilled; a judicious warmth (avoiding too great heat) should be studied. In the early weeks of life the body does not readily maintain its own temperature; hence the reason that the young of animals remain a certain time constantly near their mother. It is the same with our infants; no warmth is so equable or so good for them during the few first days or weeks of life as the warmth of their mother; hence, also, the necessity for a warm bath as the means of cleanliness.

A fallacy lurks in the notion of hardening children. The argument in favor of the attempt so to do, drawn from the "state of nature," is altogether a dangerous fallacy. All that can really be said in its favor is that it is not possible to kill all the children submitted to the system. The delicate ones will be sifted out, and the hardy ones will survive in spite of "sys-

tem." It is an error in reasoning to quote the savage state as that of nature, and, therefore, worthy of imitation. It may be urged with greater force that the nature of man's mental endowments tends to raise him from the savage to the civilized state. The natural state of man is that of civilization, with its attendant fostering care of infantile existence.

Sponge Bath.—In after-life the daily sponge bath contributes greatly to the preservation of health, by the promotion of cleanliness, and by the exhilarating influence in stimulating the circulation of the blood on the surface of the body. The warmth of reaction is more sure to follow if the bath be used on rising, while the body is still warm, and before the surface is chilled by exposure in dressing In using this, a due regard to the feelings should be observed. Some persons are extremly sensitive to cold, while others enjoy its reaction and bracing influence. The temperature of the water should, therefore, be regulated by the climate, weather, and individual susceptibility. After sponging, the whole body should be briskly dried with a rough towel, and a glow of warmth will follow.

Cold Bath.—(Temperature 50° to 60°.)—A cold bath will vary in its effects according as it is taken in a small bath, or in a river, the sea, or a quantity of water large enough for swimming, and according to the temperature of the air. The benefit to be derived from a cold bath is governed also pretty much by the state of the bather, or on the greater or less vigor of the heart's action, and of the circulation in the skin. A cold bath should not be taken with a cold skin; the best preparation is the warm glow of exercise. A plunge (head first) into cold water, even when hot and perspiring after exercise, and a good swim for a few minutes, is more surely followed by healthful reaction than the waiting until the body is dry and cool, or perhaps chilled by evaporation of perspiration. A cold bath without the active exercise of swimming should not be prolonged beyond three or four minutes; even the good swimmer must be warned that prolonged action of cold incurs the risk of cramp.

Persons in impaired state of health should take little more than a single immersion, and this should be followed by friction of the surface with towels or dry flannels. Such persons should avoid bathing on an empty stomach; it is better not to take a cold bath immediately after a meal.

The answer to questions on the advisability of cold bathing, whether in the sea or otherwise, is to be found in the state of the pulse and of the skin. With a feeble pulse and a disposition to palpitation of the heart, the flow of blood through the skin is sure to be tardy, as compared with that of health, and reaction will consequently be slowly established at the risk of congestion of internal organs. Hence, in persons disposed

towards head, or heart, or lung affections, great caution should be exercised. Persons who are subject to palpitation of the heart, giddiness, etc., had better avoid the cold bath.

Generally, it may be laid down as a rule that if cold bathing be not followed by a glow of warmth on the skin, it should not be repeated.

About two or three hours after a meal is the best time for cold bathing.

The Tepid Bath (temperature 70° to 80°) is suitable for those whose health, or sensitiveness to cold, forbid the use of the cold bath. The same rules, however, apply especially as regards the delicate in health.

The Hot Bath (temperature 98° to 110°) differs from the cold or tepid bath, inasmuch as they are preservative of health, while this is curative of disease.

It opens the pores of the skin, relaxes the muscles, soothes the nervous system, and (after its first stimulation of the heart's action is past) is a valuable agent in reducing fever and inflammatory action by the profuse perspiration that it induces—so much so, that it is often an efficacious remedy in the treatment of inflammation.

In the convulsions of infancy, the hot bath, continued from five to ten minutes, is an important part of the treatment.

In order to avoid any possible risk of the sudden immersion in hot water, it is a safe plan to have the bath at about 95° to begin with, and gradually raise the temperature to 100°, or even 105°, if profuse perspiration afterwards be desired; in this case, the bath may be continued by an adult twenty minutes or half an hour. On coming out of the bath, after rapidly wiping the surface of the body, a warm blanket should be wrapped round before getting into a warm bed.

When it is desirable to give a hot bath to a child for any febrile malady, or in any case where the child would be frightened at being put into the water, its fears may be disarmed by covering the bath with a blanket, and letting the little patient down gently into the bath.

Vapor Bath (temperature 100° to 120°) is of great use in exciting perspiration in catarrh, in simple fever, and in rheumatism. It may be extemporized by sitting on a chair enclosed in a blanket, and having a pail of hot water placed under the chair, adding to the water some red-hot stones, or brick, or iron chain. If a long pipe can be connected with the spout of a large kettle, and made to pass within the blanket, it affords a ready means of making a vapor bath.

Hot-air Bath.—(Temperature 100° to 120°.)—This acts in the same way as a vapor bath. It is readily made by burn-

ing some spirits of wine under the canopy of blanket. A convenient mode is, after the patient is seated and covered up to the throat with blankets, to place an ounce of spirits of wine in a cup, the cup standing in a basin with some water, then light the spirit and let it burn out.

THE TURKISH BATH, a combination of these, is useful in rheumatic and other chronic diseases, but requires to be used for medical purposes only under medical advice.

HYDROPATHY professes the cure of disease by baths of various kinds. It can only be properly practiced in establishments especially devoted thereto. It is expensive and, therefore, only within the reach of comparatively few.

SLEEP.

No rule can be observed with regard to the proportion of time that should be given to sleep. Much depends upon individual habit and disposition. The active mind and cheerful disposition that is never more happy than when busily employed, and finds its recreation in change of work, will generally sleep soundly and be refreshed, by six or seven hours' sleep. Less than this cannot be safely devoted to sleep by any one who does a good day's work, either bodily or mentally. There have been those who could abridge their hours of sleep to four, three, or even two, hours out of the twenty-four, but they paid the penalty of such an infringement of nature's laws by shortening the number of their days, and embittering them by the impairment of health.

The daily wear and tear of life needs the restoration of sleep to ensure healthy balance of nervous power, and that equanimity of mind so desirable in this world's strife and turmoil.

Infants and children require more sleep than grown-up persons. In fact the early days of infancy are passed in sleeping, to the infant's great gain. If otherwise its health soon suffers, and shows the want of "balmy sleep." Warmth, sleep, and food are all that are wanted in early infancy. For the first three or four years the mid-day "nap" contributes to the vigor and activity of the young child.

Throughout childhood up to puberty from twelve to fourteen hours' sleep is not an undue allowance. At all events, if less time be accorded for sleep, "early to bed" is a golden maxim. The practice of allowing infants and young children to be awake and up until ten or eleven o'clock at night, amid the glare of lights, and perhaps the noise and excitement of festivity, is the most injudicious sort of kindness to which they can be exposed.

CLIMATE.

This word embraces the consideration of many topics which our limits forbid our touching upon; but, as the present work will doubtless be read in all parts of the country (at least such is our hope), it would be incomplete without a few remarks thereon in relation to the causation and treatment of disease.

"The climate of a country or district," Dr. Copland remarks, "depends, 1st, upon its position in respect of distance from the equator, and upon its elevation above the level of the sea, and its proximity to the shores of the ocean, or the beds of large rivers, etc.; 2nd, upon the geological and mineralogical formations constituting the basis of its soil; 3rd. upon the nature of the soil itself, its cultivation, and the evgetable productions by which it is covered; and, 4th, upon the prevailing winds or currents of the air."

The Effect of Change of Climate.—An inhabitant of a temperate climate going to a tropical country will suffer from excitement of the nervous and vascular systems, by the heat and moisture of the air. The respiratory functions become less active; while there is a decrease of the ordinary action of the kidneys in carrying off the refuse matters of the circulation. The consequence is that the skin and the liver have an excess of work thrown upon them (to speak metaphorically, and also exactly), in order to rid the system of certain effete elements which the lungs cannot throw off.

Hence the "seasoning fevers," as they are called, and the disorders of the liver to which Europeans are specially liable on arrival in a hot climate, and to which full often they render themselves the more obnoxious by injudicious diet. An eminent English authority says that:

Europeans visiting hot climates should live abstemiously, taking every means to promote the functions of the skin by moderate exercise, and by daily free ablutions. Exposure of the head to the heat of the sun should be carefully avoided, as well as the risk of contracting fever by exposure to dews, the cold, and the malaria of the night air. Warm clothing should be worn at night by new-comers, as the extremes of day and night temperature in tropical regions often pass through a very wide range.

The effects of a warm and moist climate upon the inhabitants of colder regions, in decreasing the functional activity of the lungs, and increasing that of the liver and skin, has formed the basis of the recommendation of a change from a cold to a warm climate in pulmonary affections. It is, however, very doubtful whether the relaxing and enervating influence of the heat on the nervous system does not more than counterbalance

this functional compensation. Certainly, when disease in the lungs has advanced much, more harm than good generally comes of the migration. On the other hand, the tonic and bracing effect of a cold climate more frequently checks the advance of consumption, if care is taken to protect the surface from sudden chills, and so to protect it as to ensure a free circulation of the blood in the skin by out-door exercise. The British Hippocrates, Sydenham, was wont to call horse exercise the "palmarium remedy" for consumption, so strongly was he convinced of the importance of out-door exercise. A confirmation of this opinion is to be found in the fact that coachmen (if temperate men) are among the healthiest classes. In the days when locomotion was performed more on horseback than is now the case, it was said that "bagmen," or commercial travelers, enjoyed a singular freedom from consumption. Unfortunately, however, these men, then as now, too often threw away their better health by their irregularities in other directions.

While the stress of the effects of removal to warm climates upon the inhabitants of temperate regions is thus seen to fall upon the liver and skin, the reverse is seen to occur when the natives of hot climates migrate to colder countries. The negro, brought direct from Africa to England, will almost surely be the victim of consumption.

The change of climate must therefore be guided by these several conditions, both of place and person, and may further have to be altered according to the changes of the seasons, and according to the special character of the season itself. Thus, it not unfrequently happens that the south coast of England is not suitable for invalids, even so late as June, if easterly winds prevail. The air is then almost as keen as that of the directly eastern coast, and a return inland becomes inevitable.

Consumption.—In this disease, change of climate, to be productive of real benefit, must be tried at a much earlier period than is generally done, as it is often delayed a year or two after the period that any good can be expected, and the result is that more harm than good is done thereby. Hence the trial is often not made through the discredit that arises out of its misapplication. It should be borne in mind that consumption is not merely a disease of the lungs, but a general morbid constitutional condition, of which the disease in the lungs is but a manifestation. The early treatment must, therefore, be directed to invigorating the system and improving the quality of the blood. With these objects, the climate most suitable for winter residence are those of our southern coast, Madeira, Nice, Pisa, and Rome, with removal during summer months to the drier situations of our own islands.

Chronic Bronchitis.—This is an affection that is often mistaken for consumption, and one which, through its persistence and its debilitating and emaciating effects, constitutes a veritable decline. The change from a cold and moist to a mild and dry air relieves the morbid conditions of the mucous surfaces. The same climates that are of service in consumption are beneficial in chronic bronchitis. When asthma is combined with chronic bronchitis, it is also relieved by the same climate as is found useful in chronic consumption. Torquay and Undercliff, for example, are most adapted to irritable states of the mucous membrane without much secretion; Clifton or Brighton for those in which expectoration is profuse and the system debilitated; Rome, Pisa, Madeira, are suited for the latter class of cases; Nice to the former.

Chronic Rheumatism.—This is benefitted by residence in a warm climate, such as the southwestern coast of England, the south of France, Rome, and Pisa.

Gout.—This also derives benefit by a warm climate. The West India Islands are especially marked in this respect.

Dyspepsia and nervous affections connected therewith are aggravated by a cold and damp atmosphere, and are greatly relieved by change to a drier and warmer climate; but great care in dieting is needful in order to ensure the full benefit of the change. The use of stimulants must be very carefully watched. The nervous symptoms associated with dyspepsia are prone to take on the form of hypochondriasis; the change of climate should therefore be accompanied with change of occupation and of amusement. This class of cases rapidly improve under change of scene, and the relinquishment of the cares of business, to say nothing of "throwing physic to the dogs."

DIET IN RELATION TO DISEASE.

In acute diseases, the diet should generally be of the simplest and lightest kind, such as beef-tea or mutton-broth, sago, tapioca, arrowroot, or gruel, with, at the same time, some little respect paid to the palate. Due regard, however, must be paid to the general character and condition of the constitution. For instance, acute diseases may occur in a very debilitated state of the health, and then may require the addition to the above of some alcoholic stimulant. The stomach in such cases would not be able to digest solid food. The absence of this must be supplied by soups, broths, eggs, etc.

In the feeding of invalids, even children, some attention may be paid to their cravings after different articles. It will often be found that the thing longed for is not injurious, and

may be often called for in obedience to some indication by nature. The following incident may serve to illustrate this observation: A child of about four or five years old was suffering under diphtheria, and had got to refuse the port wine and beef-tea that had been ordered it. It seemed that there was nothing for it but that the child must die from starvation and diphtheria together. One day she woke up from a nap and saw a glass of ale, which was being drunk by its mother with her luncheon. This ale the child cried for, but the mother feared to allow her to drink. When appealed to, the medical attendant said, "By all means let the child have it; and even put it in her way that she may take it herself without let or hindrance." The next time the child woke up she eagerly clutched at the malt liquor and drank off a tumblerful. From that moment she began to mend, and for the next forty-eight hours persistently refused everything else, either as food or medicine, and eventually made a good recovery. When the disease, though acute, is of a less severe character, and is not stamped with extreme debility, the stomach will tolerate light solids, such as white fish, fowls, bread, rice, light puddings, and ripe, pulpy fruit and vegetables may be taken with advantage, as the acids allay thirst. In chronic disease a fuller diet is required, comprising meat with some stimulant.

Milk.—Milk is the most important article of diet in infancy, and is also both nutritious and digestible in diseases of adult life. A prejudice exists in the minds of many persons to the effect that milk is not easily digested. The opinion is, however, refuted by the fact that it forms the nourishment of infants and of young animals of all kinds. Cow's milk, however, is sometimes unsuited to the stomachs of infants brought up by hand; or, from its richness in oil and curd, to the stomachs of persons enfeebled by disease. The best substitute that can be used is asses' or goat's milk. The latter, however, is richer than the former.

For the first three or four months of an infant's life the best food is breast-milk alone. If for any reason this cannot be given, asses' milk is the best substitute. Next to this cow's milk, diluted with an equal proportion of water in which half a teaspoonful of powdered sugar of milk has been dissolved. Cow's milk differs from human milk in its excess of cream and curd. The cream consists almost wholly of oil globules. The addition of a solution of sugar-of-milk reduces it in one direction, and raises it in another, to the level of human milk; thus, sugar-of-milk contains all the saline matters of the milk from which it was made; therefore, by its addition (with water) to cow's milk, while the curd and oil are diluted, the deficiency of the salts is supplied, and thereby its

composition is as nearly as possible equalized or assimilated one to the other.

Most infants will thrive well on this hand-feeding, but there are two points of essential importance to its success. One is the giving the food with regularity. For the first two or three weeks the child should be fed every two hours during the day, and once or twice in the course of the night. The interval should gradually be lengthened after the month.

The same rule as to time should be observed, whatever be the food, whether breast-milk or any substitute.

Feeding-bottles Objectionable.—The next point, and one (if possible) more important, is that the feeding-bottle should be most scrupulously cleaned each time immediately after feeding, or small quantities of milk remaining in the tube or teat will become sour. The minutest particle of sour milk taken into the stomach with the other will act after the manner of a ferment, and favor the turning sour of the whole quantity.

It should, however, here be noted, that it does not follow that, because when a child vomits its milk it is found curdled, therefore the whole has been sour at the time of taking it. The first step in the digestion of the milk is that it is curdled by the gastric juice of the stomach, and afterwards dissolved by it. This process, however, is very different from the curdling of milk by its having turned sour out of the stomach, and it has a very different result in the process of digestion.

There is another grave objection to these tubes—they engender and foster idleness on the part of the nurse. It is a common practice to put an infant into its bed or cradle, with the teat in its mouth and the bottle in bed, and there to leave it to suckle itself to sleep; which it generally does, sucking the while even after it has fallen asleep and its bottle is emptied. The child goes on sucking at the tube, but getting no food; the infant, in popular phrase, "sucks in wind." If it does not exactly suck the wind, its fruitless sucking at a piece of india-rubber keeps up secretion of gastric juice in the stomach. This, having no food to act upon, acts abnormally upon the stomach itself, and sets up various disorders of that organ and of the intestines. Such a mode of nursing is little better than the "Gampish" trick of sticking into the child's mouth a raisin in a piece of muslin to "keep it quiet." They are alike occasions to evade the duty of really hand-nursing and carrying the child in arms.

Beef Tea is the staple of existence in many cases of illness; it is food and physic both in some fevers. It must be most carefully made, on Liebig's principles. The heat employed should not exceed 150°. A thermometer, however, is not commonly at hand, but the meat should be cut up small and

merely covered with water, in a bottle jar, in a sauce pan with cold water, near a fire, so as not to allow it to boil, but merely to stew for three or four hours. The fat may be separated by allowing it to get cold and then skimming it off. Mutton-broth might be made on the same plan, and would be more nourishing than that commonly made.

In the ordinary way of making beef tea, by boiling lumps of meat, a strong jelly may be formed, and is supposed to show its strength; but each lump is really case-hardened, and the most nourishing part locked up in each piece. The explanation is that flesh consists largely of albumen, which coagulates at 150° F.; therefore the boiling temperature, 212° F., hardens the outer part at once, and slowly the interior. To give a culinary illustration, the best way to cook a boiled joint of meat is to put it into water already boiling, and continue boiling the requisite time; the outside is at once hardened, and the gravy is locked up inside.

Eggs.—For the same reason the white of eggs, which consists wholly of albumen, is a most excellent medium of nutriment, where, for any reason, beef tea cannot be given. The white of egg stirred into cold or lukewarm milk can often be given to children or other patients who refuse beef tea. It is tasteless and colorless, therefore its presence can be disguised; whereas the yolk of egg contains fatty matters with albumen, and is easily recognized by the child both from its color and its flavor.

Water, either as an ordinary article of diet or a means of allaying the thirst in febrile states, requires that great care shall be taken to ensure that it shall be free from impurities. The most dangerous impurities to which water is obnoxious are gaseous matters, and insoluble animal and vegetable matters. Gaseous matters and vapors are readily absorbed by water, as seen in the ordinary experience of placing a basin or tub of water in a newly painted room, whereby the smell of the paint is quickly removed. Water, by reason of the same property, should never be drank from a cistern into which there is a waste pipe having a direct communication with a drain or reservoir. The poisonous gases arising from the decomposing sewage are absorbed by the water, which thus becomes the vehicle for the conveyance of the poison of malignant fevers.

The decomposing animal and saline matters of sewage also readily percolate a porous soil; so that if a well and cesspool be near one another, as is often the case both in town and country, the water becomes the channel through which deadly poison is carried.

Rain water received into leaden cisterns, or water in tanks having leaden pipes leading from them, is often contaminated

by a portion of that metal becoming oxidized and dissolved, producing colic and other signs of lead poisoning.

For ordinary domestic purposes, water is classed as hard or soft. The latter is rain water; the former spring or river water. These vary much in their degree of hardness, as may readily be noticed by their behavior with soap. With hard water the soap does not readily make a lather, but curdles on the hand. The source of hardness of water is in the lime and other salts that are dissolved out of the strata of the earth through which it has passed. These may be separated to a considerable extent by boiling, or by the addition of small quantities of bicarbonate of soda. This is the object of some persons who put a small portion of bicarbonate of soda into the teapot when making tea.

Insoluble impurities can be separated by filters, or by any arrangement by which it is made to pass through fine sand or broken charcoal. The charcoal has the property of absorbing gases from water and rendering it sweet and pure.

In the treatment of disease, water is of primary importance, as it allays thirst and fever by diluting the blood and giving the medium by which a poison may be eliminated from the system. In fever and in cholera thirst is often the one great complaint, and the cry is for water! water! This indication of nature may safely be followed, and the patient allowed to drink as freely as he will.

Water is the chief of diuretics; it increases the secretion of urine, and promotes thereby the evacuation of effete or irritant matters from the blood.

Farinaceous Foods.—Farinaceous foods should be cautiously given to young infants. Neither the secretion of the saliva in the mouth, nor of the gastric juice in the stomach, is adapted for their digestion. Among the farinaceous foods, suitable for young children, are baked flour, corn flour, biscuit powder, arrowroot, ground root, etc. It is not possible to say in which case each of these may be most suitable; what may be easily digested by one child may not agree with another, or with the same child for long together. After five or six months a crust may be given, but should be carefully watched. When some teeth are cut, the admixture of solids may occasionally be permitted; but, even when all the teeth are cut, it is advisable only to give meat every other or every third day. Soups, beef tea, etc., may be given at other times.

General Diet.—It is scarcely necessary here to enter upon the diet for adults in health, as this will depend very much upon the pursuits and inclinations of each. It is well known that those who work hard can generally eat well with-

out much regard to what is put before them—"Hunger is their best sauce."

It may suffice to offer a few remarks on the digestibility of some article of food as a guide to invalids, and with reference to the diet recommended under the several headings of disease in the following pages.

It may be stated generally that beef is less digestible than mutton, especially for persons subject to dyspepsia. Beef is more easily digested cold than hot by delicate stomachs. Both these meats will require upwards of three hours for digestion. Salt beef will demand twice the time. Veal, lamb, and young meat generally, is not so easy of digestion as the meat of animals killed at maturer age. Pork in any form is less readily digested than other meats.

Fowls, Poultry, Game, though generally regarded as light and digestible, are not always so in the cases of the invalid or convalescent; they are not wholly digested much under four or five hours.

Fish, especially the white sorts, are easy of digestion, according as they are plainly cooked. Salted fish are more slowly digested fish, as also are those that are fat, such as salmon. Much depends, however, upon the cooking, and of the adjuncts, the sauces, etc.

Melted butter is usually taken with fish, but is better omitted when they are food of the invalid. Butter, when melted, or prepared in any way over fire, readily becomes altered in its composition, and yields various fatty acids, which are the sources of indigestion. This is more especially the case with pastry, such as short pie-crust, etc. For the delicate stomach, fish cannot be too plainly and simply cooked; under these circumstances they form a light and nutritious diet.

Shell Fish, including under the term oysters, mussels, whelks, lobsters, crabs, are more or less difficult of digestion, and unsuitable for invalids. Oysters are, perhaps, the least open to the objection, but they require three or four hours' digestion, and are not the light nourishment usually supposed, unless very carefully cooked. Sweetbread and tripe are easy of digestion, as also are the brains of animals. Liver and kidneys are the reverse of digestible.

Ripe Fruits and Vegetables are more easily digested than any of the preceding articles; but then, as they consist of a large proportion of water, they are not so nourishing as animal substances. Vegetarians supplement the deficient nutritive qualities of vegetables by a liberal allowance of animal matter in the shape of eggs and milk.

CHEESE, being almost entirely an albuminous substance, contains a very large amount of nutriment; but, from this element being combined with the fatty acids and some of the oily constituents of milk, it is not easily digested by weak stomachs when taken alone. It nevertheless is often useful in prompting the digestion of other food, to which it sometimes acts after the manner of a ferment when taken in small quantities; for instance, after dinner.

Sausage, when fresh, are not unwholesome, and they contain a large quantity of nourishment in a compact form.

ALCOHOLIC STIMULANTS.—The treatment of disease, and more particularly of convalescence, can scarcely be conducted without the adminstration of stimulants; but it is obvious that it should be accompanied with emphatic caution lest the use grow into the abuse thereof. An occasional dose may soon become the habitual dram, unless self-denial and self-control be exercised.

We are not here called upon to follow in the wake of those who feel it their duty to expose the errors and weaknesses of their neighbors; suffice it that we admit that in all directions we see too free indulgence in alcoholic stimulation. There can be no two opinions upon that point. There is no amount of health or wealth that cannot or will not surely be destroyed by any one who determinedly gives himself up to drink.

The medicinal uses of stimulants are most found in chronic disease, or in acute disease occuring in extremely debilitated states. It is greviously to be lamented that the medical recommendation of stimulants is not always sufficiently guarded and watched. There has been of late a fashion to regard and to teach that all disease proceeds from debility, and therefore that it must be treated with alcoholic stimulants. Allowing (which we do not) that such might be the case, yet the inference that alcohol is the remedy is by no means conclusive. A supply of wholesome nourishment with avoidance of the causes of disease, and bodily and mental rest, will be surer in their present effects and safer in future results. Few medical practitioners can pass many years, or even months, without meeting with the melancholy results of intemperance that began with the medicinal use of brandy and water, champagne, etc. The possibility is here referred to simply as a warning to those who, consulting these pages, may feel justified in advising the use of alcoholic stimulants as a means of combating disease, lest they forget to look also to the discontinuance of their use. As regards the dietic use of alcoholic stimulants, we have only a few words to add to the caution already given.

MALT LIQUORS are, as a general rule, the most wholesome of alcoholic beverages. The alcohol is in them so combined

with saccharine matter and tonic vegetable principles that it can only be separated by a distillation destructive of all other qualities. A small quantity of mild ale or porter, taken with dinner and supper, or luncheon and dinner, supports the strength, and supplies wear and tear.

Wines resemble malt liquors in that, when pure, the alcohol is in a state of chemical combination that can only be superceded by destructive distillation. They have not, however, so much solid matter suspended in them as malt liquors. They are, for this reason, better suited to persons of weak digestive powers. The dietic and the therapeutic uses of wines must depend upon their percentage of alcohol, and upon the development in them of certain acids and spirituous combinations termed ethers, which constitute what judges of wine call the "bouquet." The proportion of unfermented sugar also is a point to be considered in selecting wine for invalids. Thus, there are sweet and astringent wines, as there are red and white wines, and there are wines in which the fermentations of the sugar is checked, and the sparkling of effervescing wine is produced.

Effervescing wines, champagne and Moselle, are among the most valuable wines for medicinal purposes. The free carbonic acid they contain renders them very serviceable in sickness and vomiting, while the alcohol, being in some peculiar state of combination, is more volatile, acts as a more rapid stimulant, effects passing off more rapidly than those of other and stronger wines.

Astringent wines, such as Burgundy, Hungarian, Bordeaux, etc., are less liable to ferment in the stomach. Port, Madeira, sherry, Marsala, are all stronger wines, and are said to be highly brandied, and therefore less wholesome for ordinary consumption; but they are (if moderately good) more useful for medicinal purposes than the lighter wines, which may be safer for daily use dietically. In this matter, however, as in many others where eating and drinking are concerned, quantity is often a more important element in the question than quality. There is, moreover, so much in fashion that it is almost impossible to say which wines are best. Moderation is the golden rule.

Spirits, the type of which may be taken to be brandy, are only of value as medicinal agents, and for these purposes they are sometimes invaluable—e. g., in low fevers, in some inflammations, and in state of debility, in sickness, and generally as indicated under the several headings of diseases in the preceding pages. We have no hesitation in affirming that raw or diluted raw spirits can never be advantageously used merely as

ordinary beverages by those who can obtain wholesome malt liquor or wines.

The habit of spirit-drinking (as grog every night) as practiced by many "very respectable people" in the middle classes, is not one whit morally or physically better than the habits of the poor besotted creatures who swarm in and out of the London gin palaces. With the moral aspects of the habit it may be said that we are not concerned, but of the physical aspects we feel morally bound by a solemn responsibility to speak. From our own personal observations we would warn all whom it may concern, that the "night-cap," as it is miscalled, gradually generates disease of the brain, liver, kidneys, with all the horrible train of diseases—delirium, paralysis, dropsy, *cum multis aliis.*

MEDICINES AND THEIR DOSES.

Over and above the physical and psychological agencies which have been referred to in various parts of these remarks, we have now to advise with our readers on the pharmaceutical means of combating disease—means which are commonly regarded as the most direct and indispensible for the purpose of modifying or arresting morbid processes. That the swallowing of drugs, however, is not the whole therapeutics will have been seen throughout these pages; as, nevertheless, their judicious use allays suffering, shortens the course of disease, and promotes restoration to health, we have selected for notice some which we deem most useful, pointing out their most prominent properties, or most common uses.

The appropriate doses are stated under three periods of life—viz.: infancy, childhood, adult age. The doses that are herein advised are quite within the limits of heroic treatment, and may be given with confidence as not unduly large. Where a blank is left, under the head of doses, it is implied that the medicine is not suited for young children. The frequency with which the dose is to be repeated mus be learnt from the instructions given under each disease.

LIST OF MEDICINES.*

Name.	Property.	Doses.			Uses and Mode of Use.
		Infancy.	Childhood.	Adult Age.	
Acetate of ammonia, solution of, or Mindererus spirit	†Diuretic, †Diaphoretic	—	2 drms	½ ounce	In febrile complaints, catarrh, etc.
Aloes	Purgative	—	2 to 5 grains	5 to 10 grains.	As a purge for worms, or for common costiveness.
Aloes, decoction of	Ditto	—	½ ounce	1 ounce	Ditto.

* In preparing or dispensing medicines, weights and measures should be used whenever practicable. They can be purchased of chemists. A graduated wineglass is a safe guide, as it is more definite than the use of spoons in administering medicines. At the same time it is advisable to procure a small glass measure for minims, or drops. It should be observed that the "minim" as measured is equal to two drops from the mouths of many bottles.

† Diuretic, acting on the kidney; Diaphoretic, promoting respiration.

Name.	Property.	Doses.			Uses and Mode of Use.
		Infancy.	Childhood.	Adult Age.	
Alum	Tonic and astringent	1 to 3 grains	3 to 5 grains	5 to 10 grains	In hæmorrhage, diarrhœa whooping-cough. Dissolved in water. As a gargle. Ten grains to the ounce of water. As a lotion for the eyes. Two grains to the ounce of water.
Ammonia, carbonate of	Stimulant	1 grain	2 grains	5 grains	In scarlet fever, dyspepsia, in chronic cough. Dissolved in water.
Ammonia, compound spirit of	Stimulant	5 drops	10 to 20 drops	20 to 60 drops	In debility, spasms, hysteria, fainting. Taken with cold water.
Arsenical solution	Tonic	—		5 drops	Skin diseases and neuralgia. To be taken in water with or after a meal.
Bark, compound tincture of	Tonic	10 to 15 drops	15 to 20 drops	20 to 60 drops	Debility, fevers, ague. Taken in water.
Belladonna, extract of	Sedative	—	—	—	As an external application. To be smeared on the painful part.
Bicarbonate of soda	Antacid	2 to 5 grains	5 to 10 grains	10 to 30 grains	In dyspepsia. Dissolved in water. Mixed with citric or tartaric acid, forms effervescing draught.
Bicarbonate of potash	Ditto	2 grains	5 to 10 grains	20 grains	Ditto.
Bismuth, nitrate of	Tonic and astringent	1 to 2 grains	3 to 5 grains	5 to 8 grains	Diarrhœa, dyspepsia.
Bitter sweet (*dulcamara*)	Tonic	—	—	2 ounces	Skin diseases. The stalks boiled in water, viz.: 1 ounce to a pint and a half boiled to 1 pint.
Borax, powdered	—	—	—	—	Used for thrush; mixed with honey, and applied to the tongue, etc.
Bromide of potass	Tonic and sedative	—	5 grains	15 to 30 grains	Epilepsy and other nervous affections. The dose requires to be gradually increased. Taken dissolved in water
Calomel	Purgative and absorbent	1 grain	2 grains	3 to 5 grains.	Inflammations, biliary disorders, constipation. May be given as a powder or made up into pill.
Camphor spirit or liniment	Stimulant	—	—	—	This medicine is used for external application.
Cantharides or blistering liquid or plaster	Stimulant	—	—	—	For external application only.
Capsicum, tincture of	—	—	—	—	Useful as an addition to gargles, in proportion of half a drachm to a six ounce gargle.
Carbolic acid	Stimulant disinfectant	—	—	—	For external application as lotions; and in carbolic acid soap for skin diseases.
Castor oil	Purgative	1 drachm	2 drachm	4 drms to 1 ounce	
Catechu tincture	Astringent	—	20 minims	30 to 60 minims	Diarrhœa — with chalk mixture.

Name.	Property.	Doses.			Uses and Mode of Use.
		Infancy.	Childhood.	Adult Age.	
Chalk	Astringent and antacid	5 grains	5 grains	10 to 30 grains	Diarrhœa. Made into mixture with sugar water.
Chloral hydrate	Narcotic	—	2 to 5 grains	10 to 30 grains	Whooping-cough, sleeplessness, spasmodic disease. This medicine has more effect in producing sleep than in relieving pain. Dissolve in water. This medicine should be given with great caution.
Chlorate of potass	Sedative	1 to 3 grains	3 to 5 grains	5 to 10 grains	In ulceration of the mouth. Dissolved in water.
Chloric ether	Stimulant, antispasmodic	—	5 drops	10 to 30 drops	In painful and spasmodic diseases. Taken with water.
Citric acid	—	—	—	20 grains	To form effervescing draughts with 20 grains of bicarbonate of soda or potash, each dissolved in a separate wine glass of water.
Citrate of iron	Tonic	2 grains	3 grains	5 grains	Debility. Dissolved in water.
Cod liver oil	Tonic and nutritive	½ dram	½ dram	½ to 1 drachm	In debility and wasting diseases. Taken in orange wine or some other simple fluid directly after meals.
Colchicum wine	Purgative and diuretic	—	—	15 to 30 drops	Rheumatism and gout.
Confection of senna (*lenitive electuary*)	Aperient	—	—	—	In piles or constipation. A teaspoonful for a dose.
Creosote	Astringent	—	1 drop	2 to 5 drops	Vomiting or diarrhœa. In water.
	Stimulant	—	—	—	As a stimulant lotion mixed with water.
Dandelion (*taraxacum*), extract of	Aperient	—	—	1 drachm	In bilious disorders. Mixed with water, or the roots boiled in water.
Dover's powder	Narcotic, sedative, diaphoretic	—	2 grains	5 to 10 grains	In catarrh, diarrhœa, rheumatism. As this medicine contains opium, it should not be given to infants.
Epsom salts	Aperient	½ dram	2 drms	2 to 8 drachms or 1 oz	In cold water.
Ether	Stimulant antispasmodic	—	10 drops	30 to 40 drops	In hysteria, spasms, fainting. Taken in water.
Friar's balsam	Stimulant	—	—	10 to 30 drops	For chronic coughs. Taken in gum water.
	Stypic	—	—	—	Useful for cuts, applied on lint or rag.
Gallic and tanic acids	Astringent	—	3 grains	5 grains	In hæmorrhages. Made into pills, or mixed with gum water.
Gentian, tincture of	Tonic	—	—	1 drachm	Debility and dyspepsia. In water.

Name.	Property.	Doses.			Uses and Mode of Use.
		Infancy.	Childhood.	Adult Age.	
Goulard's extract and lotion, (*extract of lead*)	—	—	—	—	One drachm added to a pint of rain water, or distilled water, forming a good cooling lotion.
Grey powder (*mercury and chalk*]	Aperient	1 grain	2 grains	5 grains	In sugar or treacle.
Guaiacum, tincture of	Stimulant and tonic	—	—	1 drachm	In chronic rheumatism. Taken in milk, or water.
Hemlock extract of	Sedative	—	2 grains	5 grains	In spasmodic and neuralgiac or other painful complaints; as pills.
Henbane, extract of	Sedative	—	—	3 to 5 grains	As a pill.
Iodide of potass	Absorbent and tonic	1 grain	2 grains	5 to 10 grains	In chronic rheumatism and glandular disease. Dissolved in water.
Iodine, tincture of	Absorbent and stimulant	—	—	—	For external application in glandular or other chronic enlargments. Apply with a feather or brush.
Iodide of iron, syrup of	Tonic	—	½ dram	1 drachm	In strumous disorders or debility.
Ipecacuanha wine	Emetic	1 drachm	1 drachm	1 drachm	When given as emetic, the dose should be repeated every five or ten minutes until the vomiting begins.
	Expectorant	2 drops	3 to 5 drops	5 to 15 drops	For coughs and colds.
Ipecacuanha powder	Emetic	—	—	20 to 30 grains	In warm water, followed by copious draughts of water to promote vomit
Iron, muriated tincture of	Tonic	2 drops	5 drops	to 30 drops	In water, to which sugar is added in the case of children.
Iron or steel wine	Tonic	½ dram	1 drachm	—	
Jalap powder	Purgative	—	5 grains	10 to 30 grains	
James's powder	Diaphoretic	1 grain	2 grains	3 to 5 grains	In catarrh and simple fever.
Laudanum (*tincture of opium*)	Narcotic	—	—	10 to 40 drops	For pains, spasms, or cramps; in water.
Lead, acetate	Astringent	—	1 grain	2 grains	In hæmorrhages. As a pill, made up with moist bread crumbs.
Magnesia, carbonate of	Aperient and antacid	2 to 5 grains	5 grains	½ dram	Dyspepsia and costiveness.
Manna	Aperient	½ dram	1 drachm	—	Mixed with food of an infant
Matico	Astringent and styptic	—	—	—	Applied on lint or wool, if in form of tincture, or the dry leaf applied on a cut.
Mercurial pill (*"blue pill"*) Mercury and chalk [*see* Grey powder]	Aperient	—	—	3 to 5 grains	
Morphia, muriate or acetate	Narcotic	—	—	¼ to ½ grain	Only for severe pain. Not to be given to infants or young children.

Name.	Property.	Doses.			Uses and Mode of Use.
		Infancy.	Childhood.	Adult Age.	
Muriatic acid (*diluted, 1 part to 10 of water.*)	Tonic	—	15 drops	20 drops	In debility, indigestion, diarrhœa. In two or three tablespoonfuls of water.
	Astringent	—	—	—	As a gargle for sore throat. One part to twenty of water.
Nitre powder	Diuretic	1 grain	2 grains	5 to 10 grains	In febrile disorders and dropsies.
	Stimulant	—	—	1 drachm	As a gargle, dissolved in six ounces of water.
Nitre (*sweet spirit of nitrous ether*)	Diuretic	—	10 to 20 drops	30 to 60 drops	Catarrh and febrile complaints.
Nitric acid (*diluted with 10 parts of water*)	Tonic	—	5 drops	15 drops	Debility, sore throat, etc. Same as muriatic acid.
Opodeldoc (*soap liniment*)	—	—	—	—	For external application.
Opium	Narcotic	—	—	½ to 1 gr	In painful disorders; for sickness and diarrhœa.
Oxide of zinc	Tonic and stimulant	—	—	—	Most commonly used in ointment, or dusted on the surface.
Oxymel of squills.	Diuretic, expectorant	—	½ dram	1 drachm	For coughs. Mixed with paregoric or ipecacuanha wine.
Paregoric	Sedative diaphoretic	—	10 drops	20 to 60 drops	Catarrhs and coughs alone, or as above in water.
Potash, solution of	Absorbent and antacid	5 drops	10 drops	10 to 20 drops	Dyspepsia and chronic glandular enlargements Taken in water.
Quinine	Tonic	½ grain	1 grain	2 to 5 grains	Debility, ague—in water, or made into pills.
Rhubarb powder	Aperient	1 grain	2 to 5 grains	5 to 20 grains	
Ditto, tincture	—	—	2 drms	2 drs to 1 oz.	
Salvolatile, spirits of (*see* Ammonia)					
Santonin	Purgative for worms	3 grains	3 to 5 grains	—	Three doses should be given on alternate mornings, in milk or water.
Senna, infusion of	Aperient	2 drms	½ ounce	1 ounce	Infusion made by pouring hot water on the leaves, and let stand until cold.
Sulphuric acid (*diluted with 10 parts of water*)	Tonic	—	5 drops	15 drops	In debility and dyspepsia.
	Astringent	—	5 drops	15 drops	Hæmorrhage, diarrhœa, cholera, night sweats. Taken with a wineglass of water.
Tartar emetic	Diaphoretic, depressing	—	—	⅛ to ¼ grain	In febrile and inflammatory disorders. Dissolved in water. Used also in form of ointment.
Turpentine, spirits of	Purgative stimulant	—	—	1 to 2 drachms	For tape-worm. Taken fasting in the morning in milk or water.

Name.	Property.	Doses.			Uses and Mode of Use.
		Infancy.	Childhood.	Adult Age.	
	Astringent	—	—	5 to 20 drops	Hæmorrhage. Taken in water.
	Stimulant	—	—	—	For external use as liniment or stupes.
Zinc, sulphate of	Tonic, astringent	—	¼ grain	¼ to ½ grain	In chorea and other nervous affections.
	Emetic	—	—	20 grains	In cases of poisoning. Dissolved in water.

ARTICLES SUITABLE FOR A MEDICINE CHEST

Acetate of ammonia, or Mindererus spirit.
Acetate of lead.
Adhesive plaster.
Aloes.
Alum.
Bark, compound tincture of
Basilicon ointment.
Bicarbonate of soda.
Blistering plaster, or liquid.
Borax.
Calomel.
Carbonate of ammonia.
Carded wool.
Carded oakum. "Stypium."
Castor oil.
Catechu, tincture of
Chalk, prepared.
Cod liver oil.
Compound colocynth pills.
Compound rhubarb pills.
Creasote.
Diluted sulphuric acid.
Dover's powder.
Epsom salts.
Ether.
Forceps of different sizes.
Glass measures.
Grey powder, or mercury with chalk.
Iodide of potassium.
Iodine, tincture of.
Ipecacuanha powder.
Ipecacuanha wine.
Iron, muriated tincture of
Jalap.
James's powder.
Laudanum.
Linseed meal.
Lint.
Lunar caustic.
Magnesia.
Mortars and pestles.
Nitre, powdered.
Nitre, spirits of.
Oil silk, or gutta percha tissue.
Opodeldoc.
Oxide of zinc.
Paregoric.
Peppermint, essence of.
Quinine.
Rubarb powder.
Scales and weights.
Scissors.
Senna leaves.
Spatulas.
Tartaric acid.
Tincture of benzoin, or Friar's balsam.
Turpentine, spirits of.
Zinc, sulphate of.
Zinc, oxide of.

HOUSEHOLD.

The Kitchen.—One of the finest house-keepers in the United States says: "If scrimping must be done, scrimp parlor and sitting-room, but have the kitchen and bedrooms as comfortable as possible." Another writer observes: "The kitchen is to the house what the stomach is to the body, and should be the most spacious, best lighted, and best ventilated apartment in the house." This remark, however, is aimed mainly at city homes, where the kitchen is too often a mere little basement cellar, badly lighted and illy supplied with pure air, from which it is no wonder that the servants are continually rising to the upper regions to "give warning." In the country the average kitchen is far more decent, but still the erring house-keeper, anxious to "have things like other people," is prone to pinch the poor kitchen in order to furnish the parlor in gim-cracks.

This is all wrong. If one's house were intended for entertainment and continual festivity, then it would be well to place its parlor and dining-room first and foremost; but in a farm house, where the house-mother's work lies mainly in the kitchen and dairy, and where are needed all the aids and conveniences for making this work pleasant as well as profitable, it is simply silly to deny one's self valuable and useful every-day things for the sake of what-nots, upholstered chairs and Nottingham-lace curtains, that must necessarily be shut up, and of no benefit to anybody nine-tenths of the year.

The room should be of good size, with windows on opposite sides, as they thus give a peculiarly cheerful light. The ceiling and walls should be whitened or calcimined in some

cheerful tint, and the woodwork oiled and varnished. For the floor—if it is even and of decent quality of lumber—nothing is better than two or three coats of oil, put on one after the other as fast as absorbed. Such a floor needs no scrubbing, a weekly mopping with plenty of warmish water, being sufficient to keep it clean. Comfortable little rugs should be placed before the sink and the ironing table, and, if this room must do duty as a dining-room, there should be, in winter, a large square of carpeting under the dining-table. A neat screen, made by tacking chintz or furniture calico upon a light wooden frame, about five feet high and six feet wide, might be placed between the table and the cook-stove, not only to temper the heat, but to shut off the not always attractive view of saucepans, spiders, and kettles used in the dinner-getting.

The sink should be capacious, lined with zinc, provided with drain-pipes, and flanked by pumps connected with cistern and well. Underneath may be a cupboard for pots and kettles, and above it a row of pegs on which to hang a dishcloth holder, a stiff brush for cleaning vegetables, a little mop for washing bottles and narrow-necked pitchers and jars, the lamp scissors, and such small articles as are in daily use in this department of the kitchen. Two small shelves should be placed at either end for soap dishes. A large, conveniently arranged sink goes a great way in making kitchen work easy.

A good-sized, substantial table of white-wood or pine is needed for ironing and baking days. It should have three drawers—a large one for ironing sheets, shirt-board and holders, and two smaller ones for baking-tins, spoons and knives used in cooking, and boxes of spices, salt, etc. Having once used such a table, no housekeeper will like to be without it. Above this table can be fastened a hanging rack for ironed clothes. These are much more convenient than the sort which stand on the floor, and when not in use can be folded back against the wall, entirely out of the way.

For washing days are needed a long bench two and a half feet wide, and of the right height, two or three tubs, a wringer, and, for heavy clothes, a washer. The latter, which costs $5 or $6, can be fitted to any tub, and ought to be an indispensable article. It is to washing-day what a reaping-machine is

to an eighty-acre wheat field; and no farmer should neglect to provide one for his kitchen, unless he is willing to settle down to his harvesting with merely the sickle and the "cradle" of his forefathers! These items come under the head of kitchen furniture, but are, of course, kept in the cellar, or in a closet opening from the kitchen.

Along with a first-class cooking-stove, for it is not economy to have a poor one, should be selected the following quite necessary articles: Wash-boiler, tea-kettle, soup-pot, frying-kettle, spider, two or three granitized saucepans of different sizes, four bread-tins, two gem irons, coffee and tea-pots, large and small iron spoons, wire steak-broiler, wire toaster, steamer, pudding mold, patty pans, potato masher, skimmer, cream whipper, gravy strainer, egg-beater, half a dozen cake and pie tins, large and small graters, a dozen muffin rings, or a muffin pan, which is more convenient than the rings, a colander, a quart measure, and a griddle. No doubt other items will readily suggest themselves, but these, at any rate, are essential, if good housekeeping is the object. A proper and convenient place to keep them is a large, deep-shelved cupboard, with close doors, in which the common crockery and glass can also be kept.

The best arrangement is to have cupboard room for all table and cooking ware, and keep food and provision stores in a cool, well ventilated closet, that can be effectually closed to dust and flies.

Let the farmer provide a large, pleasant kitchen and interest himself in its conveniences for work—being as enthusiastic in furnishing labor-saving machines for this department of farming as for his outside fields—and he will find that he makes an investment that pays an hundred fold. Let the farmer's wife make the kitchen a bright and sweet-aired realm, and be proud to be its intelligent and efficient queen. Let her beautify her work as much as possible, and lift it above the dull, discouraging slough of drudgery. With conveniences for work, and a cheerful, comfortable place to work in, the women are few who will not make their homes "the dearest spot on earth" to all who dwell within them.

The Dining-room.—Although there are many country kitchens so shining and orderly and clean aired that it is a

pleasure to break bread in them, there are many others which, owing to a large family and a pressure of work, cannot always be nice and orderly at meal times; so it is well, if it can be afforded, to have a small cheerful room opening from the kitchen, easily warmed in winter, and from which heat and flies can be excluded in summer, where meals can be eaten in the healthful serenity and comfort which is almost as essential as the food itself. What can be more refreshing to the laborer than to enter from the blistering glare of a harvest day into a cool, softly lighted room, in which the fragrance of freshly gathered flowers, or the aroma of leafy boughs, mingles its poetry with the cheerful prose of the beef and vegetables? And how pleasant and restful it is for his helpmate to lay aside her kitchen cares and kitchen apron together, and come smiling and tidy to her little throne behind the tea-service.

Such a room requires very little furniture. The walls should be of neat and quiet tint, with two or three pleasing pictures and some brackets for pots of ferns, or such vines as will grow prettily in the shade during the hot summer weather. In winter a few petunias and two or three foliage plants will fill the sunny windows with brightness and bloom. There should be a long, substantial table, with plenty of elbow room for all, and a side-board or cupboard for table-crockery. A small table will be found a convenience—if there is no side-board—for holding such dishes as are used toward the end of a meal at dinner time, when the varieties of food have a tendency to crowd each other. The window curtains may be plain shades of color suited to the walls of the room. Nothing can be better for the floor in summer time than an oiled surface, like that of the kitchen, which can be made comfortable to the feet in winter by a large "crumb-cloth" of drugget or home-made carpeting.

In more opulent farm homes, where the wife has liberty to devote more time and means to house decoration and furnishing, very handsome dining-rooms can be achieved with a moderate outlay. There should be high walls, a fire place, and a fine large window looking to the south or east. All the rest is in the hands of the mistress. If the floor has been laid in light and dark woods, well and good. It will be a thing of beauty through more than one life time and always look genu-

ine and substantial, as everything about a dining-room should. If, however, the floor is of pine, it may be stained in blocks or stripes, in a bordering two feet in width, covered with two coats of the best varnish, and the centre adorned with three or more breadths of pretty carpeting.

Have a carpenter construct a side-board of simple but substantial form, faced with oak or maple, or else made of the best pine. Glue artificial wood carvings of fruits in the centre of the top, and upon each door and drawer, and finish the whole with oil and varnish.

The table may also be home-made, and large and solid, with rounded corners, and substantial turned legs with casters. If not of real oak, the legs should be nicely stained to imitate it. If colored table-linen is used, it should be buff and white, with green borders, or buff and green in any neat, small patterns. These cloths, however, are generally covered with plain white ones at meal time.

Above this table there should be a handsome hanging lamp or small chandelier, with perhaps a little basket of Kennelworth ivy, or other gracefully growing vine, suspended from it. Such a light glorifes the plainest tea table.

As for chairs, there are a great many ways for achieving handsome ones without paying five dollars apiece for them at furniture shops. If a dozen oak chairs without seats can be obtained "in the rough" at the factory, they can be transformed into something pretty and substantial at small cost. They should first be oiled and varnished. Then with some stout sacking or canvas, some rich, dark cretonne, some gimp and furniture tacks, and either hair or wool for stuffing the seats—being careful to fasten the canvas securely in place and to cut the cretonne to fit neatly—even the cheap "splint-bottoms" which cost much less than oak, can be made into handsome chairs by painting the wood-work black, ornamenting it with gilt and scarlet lines, and varnishing—the seats to be upholstered in cretonne, striped linen, or common chintz.

The Parlor.—If means are small, and best room furniture seems to be among the things never to be obtained, let not the whole house be made dismal because of it; but rejoice that there is a kitchen, that there are comfortable bedrooms, and

that there is a bit of Heaven in the form of a flower garden under the windows!

Even if one have but a small room to devote to this purpose, it can be made very pleasing, and has the advantage of requiring less furniture. A fire-place, with a mirror above it and a large wide-ledged window opposite, make the room already half-fitted up. The ceiling calcimined with the palest blue, and the walls with a tint two shades deeper, will have the effect to make the room appear more spacious. A border of dark and light blue, or of bluish-green and gold, should be used on such walls. The wood-work should be stained walnut color and varnished. The most suitable carpet would be an ingrain in small figures of blue and gray, with perhaps a bit of yellow or a bit of rose-colored scattered through it. Plain blue or gray lambrequins should be used for the windows, trimmed with fringe of the same color. For the curtains beneath them, sheer Swiss muslin is always pretty and graceful. Sometimes they are made with a knife plaiting or a fluted ruffle down the inner edges and across the bottom; but they look well when finished with simple hems, and are much easier laundried.

The fire place should be treated after the manner described in a previous chapter, and will be found the most effective feature in the room, especially if furnished with a good sized mirror, which will reflect back all the light and beauty of the apartment, and, like the cool color on the walls and ceiling, enhance its size. All those tasteful but restricted house-keepers who are anxious to have really attractive parlors, should aim for simply these three things—a large, wide-silled window, a fire-place, and a generous-sized mirror to place above it—letting curtains and carpet and chairs come about as they can; or using for a while plain shades for the windows, and a neat matting for the floor. Adding two or three pictures, a few books, some growing vines, and an easy chair to such a room, it is already cosy and hospitable in its aspect. In this room, as in all others, one should avoid a cluttered, crowded appearance. Do not afflict the wall with a general outbreak of small pictures, brackets, and fancy articles, as if a notion store were being fitted up. It is better to distribute such

things throughout the house, that each room may have its two or three touches of graceful fancy.

For a table obtain something in a round or oval shape. It may be of pine or whitewood, but must be strong and substantial. Paint the legs black and varnish them. The top can be covered with a blue or gray cloth, embroidered about the edges, if one has time, with silk or white zephyr wool. Above the table suspend a pretty hanging lamp with shade.

Sometimes old chairs can be purchased at an auction, or dragged out of a garret, and transformed into beautiful things, with paint and varnish, decalcomania-gildings, and stuffed seats of rep or cretonne. These, with a light willow rocker, or a camp-chair and a handsome foot-stool or two, will comfortably complete the furnishing.

Remarks.—The dining or breakfast-room should be cool, light, and airy, with not much more than the indispensable furniture.

In summer, the floor covered with a staw-matting or an oil-cloth; in winter, with a dark, warm-looking carpet.

A sideboard, or narrow tables, at the side or end of the room, for the convenience of dessert and changes of dishes; or else have dumb waiters (which are stands supporting large trays).

Most modern houses are built with sliding closets; when the dining room is above the kitchen, this is almost indispensable; or the waiters' pantry—between the dining room and kitchen—has an open communication with it, that the dishes may be passed to and fro from the cook, without the delay and awkwardness of opening and shutting the doors; or, when there are no servants in attendance, it is convenient to have the dessert arranged on a tray, covered with a white napkin, and placed on a stand or small table at the left hand of the mistress or head of the table, and one on the other hand for receiving empty plates, etc.

For Breakfast.—Have a white cloth, with the folds regular and perceptible; let each dish be polished with a soft napkin, as it is placed upon the table, otherwise there is apt to be a dimness from having been put together before they were perfectly dried; and, further, to remove the traces of the neces-

sary handling, in putting them to their places and returning them to the table.

The plates may be put in a pile at the left hand of the carver or at regular intervals around the table. A vast differance may be made in the appearance and neatness of the table, by the manner in which the knives and forks, and spoons, and other paraphernalia, are placed.

The coffee-urn or pot should have on its brightest face, and all the recommendative warmth of its nature—ready for a free outpouring; the cream or boiled milk should not lack heat, and, not to "waste its sweetness" on the unappreciating air, should be contained in a covered pitcher of tin or other metal; the sugar-basin, whether the same as the other dishes, or of metal, should be bright and covered, with a large-sized tea or sugar-spoon beside it; the cups and saucers may be placed in heaps of three, within the circle of the sugar, slop, and cream vessels. Let the urn or coffee-pot be set at the right hand side of the person who serves it; and, if tea is used, let it be placed on the same side in a line with it; the one to be least called for, to stand at the outer corner of the tray—which may be placed at the middle of the broadside of the table, or at one end.

Before putting the dishes on it, the tray should be covered with a white napkin, fringed at the ends. Small napkins or doyles, folded in four and ironed very smoothly, may be laid at each plate; which should be reversed, or turned the bottom side up, and the knife and fork at the right side, or the knife at the side and a silver fork in front of the plate. Since so it is, that many Americans dislike the use of a silver fork—finding it exceedingly clumsy and awkward—it is best to place the one belonging to the knife with it, at the side of the plate, leaving it optional which to make use of.

Let the cruet-stand or castor occupy the centre of the table. If there are more than five or six persons, have two small plates of butter, one at either end of the table, and opposite each other. Let there be two plates of bread or rolls, or one of either of these, and the other place for hot griddle-cakes, or corn-bread, or toast.

Opposite the tray or head of the table, let the steak, or fry,

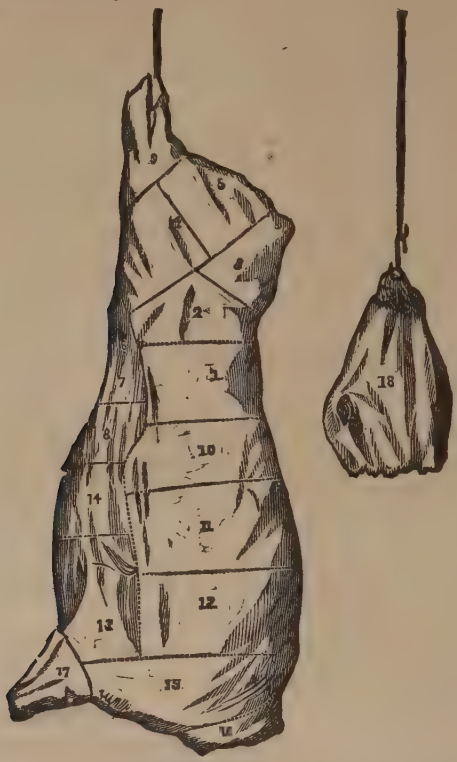
(or whatever principal dish,) be placed, with the carving-knife and fork before it, and dishes of hominy, or boiled rice, or mashed potatoes, and boiled eggs, or hash, opposite each other, and the plates of bread between the steak dish and tray, having one of the plates of butter between each two, and the castor in the centre; also one or two salt stands filled with fine salt, and neatly marked with a teaspoon or otherwise, and a salt-spoon across each, and may be placed diagonally opposite each other. These, with a pitcher of ice-water and several tumblers, occupying the corners of the table on either side of the carver, complete the breakfast-table.

If there is a servant or waiter in attendance, let such stand at the left hand of the mistress, or head of the table, with a small tray, and pass the cups to and from her, presenting it at the left hand.

The Dinner Table.—Without a perfect knowledge of the art of carving, it is impossible to perform the honors of the table with propriety; and nothing can be more disagreeable to one of a sensitive disposition, than to behold a person, at the head of a well-furnished board, hacking the finest joints, and giving them the appearance of having been gnawed by dogs.

It also merits attention in an economical point of view; a bad carver will mangle joints so as not to be able to fill half a dozen plates from a sirloin of beef, or a large tongue; which, besides creating a great difference in the daily consumption of families, often occasions disgust in delicate persons, causing them to loathe the provisions, however good, which are set before them. One cannot, therefore, too strongly urge the study of this useful branch of domestic economy.

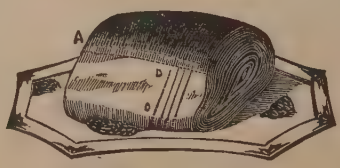
Carving.—An ox is divided by the butcher into the following joints, London style:



1. Sirloin.
2. Top, or aitch-bone.
3. Rump.
4. Buttock, or round.
5. Mouse buttock.
6. Veiny piece.
7. Thick flank.
8. Thin flank.
9. Leg.
10. Fore-rib (5 ribs).
11. Middle rib (4 ribs).
12. Chuck rib (3 ribs).
13. Shoulder, or leg-of-mutton piece.
14. Brisket. 15. Clod.
16. Sticking.
17. Shin.
18. Cheeks, or Head.

Fish is cut with a silver fish-slice, or the more modern large

TURBOT.



MIDDLE-CUT OF SALMON.

silver-fish knife and fork. Large flat fish, as turbot, brill, John Dorey, etc., must first be cut from head to tail down the middle, and then in portions across to the fin, which, being considered a delicacy, is helped with the rest. (See cut.)

Salmon is cut in slices down the middle of the upper side, as from A to B, and then in slices across D to C, and a little of the "thick," or upper side, and "thin," or under side, are put on each plate.

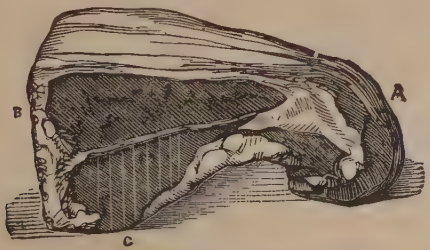
A mackerel divides between four people; the fish-knife is passed between the upper and under side from head to tail, and each side is halved to help. A cod is cut cross-ways, like

COD FISH.

salmon, from C to B, and in down slices as from A to B, and a small piece of the sound is sent with each helping. Small fish, as smelts, are sent whole, one on each plate, as are whiting.

Fried soles are cut across right through the bone. The "shoulder" or head end, should be first helped.

A sirloin of beef is cut across for the under-cut, and lengthways for the upper. You should ask your guest if he or



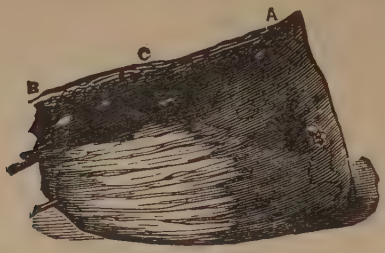
SIRLOIN OF BEEF.

she prefers the under-cut, which is by some considered the most delicate part of the beef, and is disliked by others. Slices from the under cut should be thick.

Rolled ribs and a round of beef are easily carved in hori-

zontal slices over the whole surface. The slices should be very thin.

Boiled beef should also be cut in thin horizontal slices the

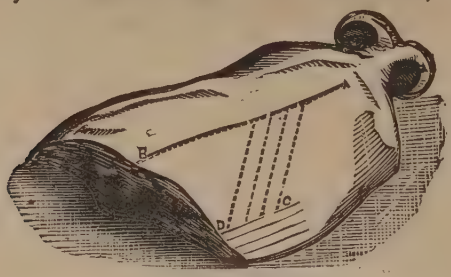


AITCH-BONE.

size of the joint itself in length and breadth. (See cut.)

Mutton appears on the table in four forms—the saddle, the leg, the shoulder, the loin.

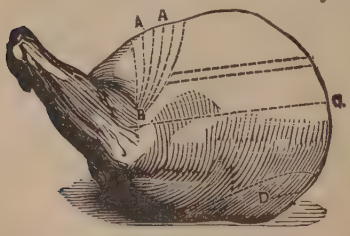
The saddle is the joint ordered for a large dinner party. It is cut in very thin slices close to the backbone; B to A and



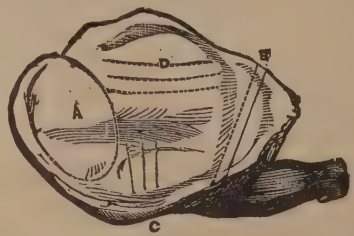
SADDLE OF MUTTON.

then downwards from A to D and C; but a lady is scarcely ever required in the present day to carve a saddle of mutton.

A shoulder must lie with the knuckle towards your right, and the blade-bone towards your left hand.



SHOULDER OF MUTTON.



SHOULDER OF MUTTON.

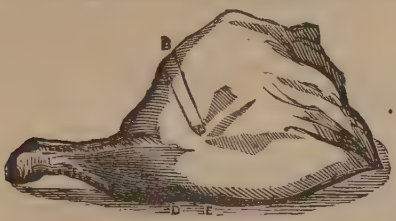
In the middle of the edge of the part farthest from you

place the fork, and then give one sharp cut from the edge to the bone. The meat flies apart, and you cut rather thick slices on each side of the opening A to B till you can cut no more.

You will then find two or three slices from the centre bone to the end B to C. Afterwards the joint must be turned over, and slices cut from the under side.

Some people, instead of cutting the joint in this manner, begin with slices cut lengthways near the middle of the joint from the end to the knuckle, and it is the better way.

A leg of mutton must be placed with the knuckle towards your left hand; you then cut into the side farthest from you

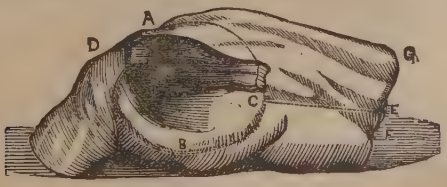


LEG OF MUTTON.

towards the bone B to C, helping thin slices from the right and thick slices towards the knuckle. The little tuft of fat near the thick is a delicacy, and must be divided among your guests.

A loin of mutton is carved either through the joints, which brings it into the form of "chops," or it is cut lengthways, in a parallel line with the joints. The latter is the best mode for a lady, but a loin is rather for family consumption than for guests.

A fore-quarter of lamb consists of a shoulder, the breast, and the ribs, and, alas! when the carver has to dissect it! If a lady is obliged to carve this joint, she must first place her knife upon the shoulder, draw it through horizontally, and then



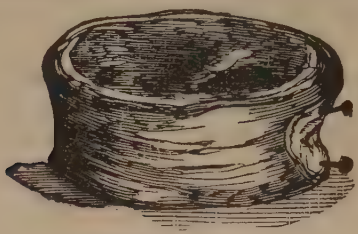
FORE-QUARTER OF LAMB.

remove the joint whole, placing it on a separate dish, which is held for its reception. She must then cut off the breast and

separate the ribs (see cut); but the cook should always cut off the shoulder, and leave it on the joint.

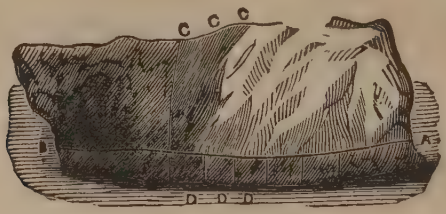
The hind-quarter consists of a leg and loin.

A fillet of veal is cut in horizontal slices like a round of



FILLET OF VEAL.

beef; they must not be too thin. The stuffing in the centre is taken out and helped with a spoon.



BREAST OF VEAL.

In a breast of veal the ribs should be first separated from the brisket, after which either or both may be sent round.

A calf's head must be cut down the centre in rather thin slices on each side. The meat round the eye is scooped out;

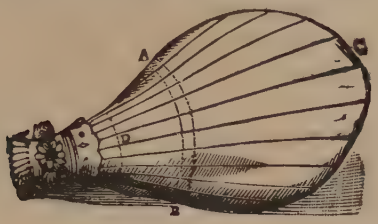
HALF OF CALF'S HEAD.

it is considered a delicacy. A small piece of the palate and accompanying sweetbread must be sent on each plate.

Roast pork is never seen at dinner parties, but is occasionally served at a family dinner.

The leg is carved like a leg of mutton, but the slices should be thicker and not so large.

A ham may be cut in three ways—1st. By beginning at the knuckle, which must be turned towards your left hand and cut



HAM.

in a slanting direction; or at the thick end, which is then turned towards your left; or in the ordinary manner, like a leg of mutton, beginning in the centre.

The slices must be as thin and delicate as you can possibly cut them. One slice is given as accompaniment to fowl or veal.

A rabbit has the legs and shoulders removed with a sharp-

BOILED RABBIT.

pointed knife, then the back is broken into three or four pieces at the joints.

Hare is thus carved: First, take off the legs. Cut two long thin slices off each side of the back B to A; then take off the shoulders, and break the back into four pieces with the fork. Cut off the ears, insert the point of the knife exactly in the

HARE.

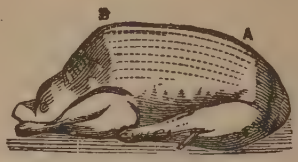
centre of the palate, and drawing it to the nose, split the head

in two. But when only a small portion of the hare is eaten, and it is only served at second course, it is more elegant for a lady to help a portion of the side with a spoon, as we have often seen done.

The best parts of a hare are the slices from the back, the head, and ears. But ladies never eat the two latter. They should be sent to any gentleman guest who is known to be an epicure.

A chicken is carved thus: Take off the wings, cut slices from the breast, take off the merrythought and side bones. The liver wing is the best part of the chicken after the breast;

ROAST FOWL.



BOILED TURKEY.

but you should help the breast first, then both wings. If you have many to help, manage to reserve a slice of white meat to send with the legs and sides.

A partridge is carved like a fowl; so is a pheasant.

A pigeon is cut in halves right down the middle, and half is sent at once to the guest.

A snipe is treated in the same way.

Very small birds are sent whole.

A turkey and goose are helped by cutting slices off the breast, and then the wings and legs are taken off. Wild duck is helped in the same manner.

HAUNCH OF VENISON.

A haunch of venison should be cut from A to B close to the knuckle. (See cut first.) Then from C to A.

Coffee is sent to the gentlemen in the dining-room. Tea

only is handed after dinner, when the gentlemen have left the dinner-table.

A few hints are prefixed on the etiquette of the dinner-table, which will be found useful. In that, however, much must be left to a quick and observant eye, and a determination to render yourself as agreeable as possible.

As Host.—The important day on which you feast your friends being arrived, you will be duly prepared to receive the first detachment. It were almost needless to observe that the brief interval before dinner is announced may be easily filled up by the common-place inquiries after health, and observations on the weather; as the company increases, provided they were previously acquainted, you will find your labors in keeping up the conversation very agreeably diminished.

While your guests are awaiting the announcement of dinner, it will be expedient that you should intimate to the gentlemen of the party, as unobtrusively as possible, which lady you wish each to take in charge, that, when the moment arrives for your adjournment to the dining-room, there may not be half a dozen claimants for the honor of escorting *la plus belle* of the party, while some plain *demoiselle* is under the painful necessity of escorting herself. Such a scene as this should be carefully provided against by the mode above suggested.

When dinner is announced, you will rise and request your friends to proceed to the dining-room, yourself leading the way, in company with your most distinguished female visitor, followed immediately by the hostess, accompanied by the gentleman who has the best claim to such an honor. The remainder of the guests then follow, each gentleman accompanied by the lady previously pointed out to him.

Arrived at the dining-room, you will request the lady whom you conducted, to take her seat on your right hand; then, standing behind your chair, you will direct your visitors to their respective seats.

Having taken your seat, you will now dispatch soup to each of your guests, from the pile of plates placed on your right hand, without questioning any whether you shall help them or not; but, dealing it out silently, you will first help the person

at your right hand, then at your left, and so throughout the table. You will not ask to be allowed to help your guests, but supply a plate in silence, and hand it to your servants, who will offer it to such of the company as are unprovided. Never offer soup or fish a second time.

If a dish be on the table, some parts of which are preferred to others, according to the taste of the individuals, all should have the opportunity of choice. You will simply ask each one if he has any preference for a particular part; if he replies in the negative, you are not to repeat the question, nor insist that he must have a preference. Do not attempt to eulogize your dishes, or apologize that you cannot recommend them,—this is extremely bad taste; as is also the vaunting of the excellence of your wines, etc., etc. Do not insist upon your guests partaking of particular dishes. Do not ask persons more than once, and never force a supply upon their plates. It is ill-bred, though common, to press any one to eat; and, moreover, it is a great annoyance to be crammed like turkeys Neither send away your plate, nor relinquish your knife and fork, till your guests have finished.

Soup being removed, the gentleman who supports the lady of the house on the right, should request the honor of taking wine with her. This movement will be the signal for the rest. Should he neglect to do this, you must challenge some lady. Until the cloth be removed, you must not drink wine except with another. If you are asked to take wine, it is a breach of etiquette to refuse. In performing this ceremony, (which is very agreeable if the wine be good,) you catch the person's eye and bow politely. It is not necessary to say anything.

If you have children, never introduce them after dinner, unless particularly asked for, and then avoid it if possible.

Never make any observations to your servants at dinner, other than to request them to provide you with what you require, or take away that which may be removed.

With the dessert, you will have a small plate, two wine-glasses, and *doyles*, placed before each guest. If fresh fruit be on the table, as pears, apples, nectarines, etc., a knife with a silver or silver-plated blade should be placed by the side of

each plate; a steel blade, in addition to being discolored by the juice, imparts an unpleasant flavor to the fruit.

As Guest.—To dine out, it is usually understood that you must be invited. There are, however, some gentlemen who have attained to that high degree of refinement which enables them to dispense with such a stupid ceremony. They drop in as dinner is being served up, when it is impossible that the party on whom they intrude can do other than to request them to stay and dine, though we suspect he has a much stronger inclination to kick the unwelcome guest into the street. We would recommend you to eschew such practices; but when invited, return an answer in plain terms, accepting or declining. If you accept, be there at the appointed time. It is inconvenient, on many accounts, to yourself and your friends, to be either too late or too early. You will probably have to wait a little time before dinner is announced. During this short period, render yourself as agreeable as possible to the assembled company.

Your host will doubtless point out to you the lady he wishes you to escort to the dining room. You will be in readiness to attend upon her the moment you are summoned to adjourn. Offer her your right arm, and follow in order. Should you have to pass down stairs, you will give the lady the wall. You will take your seat at the table on the right hand of the lady you conducted. Being seated, soup will be handed round. When offered, take it; but if you prefer fish, pass it on to your neighbor. You must not ask for soup or fish a second time; it will not be offered—you would not be so rude or selfish as to keep the company waiting for the second course, that you may have the pleasure of demolishing a double portion of fish.

Fish must be eaten with a silver fork, as the acid in the sauce, acting on the steel of an ordinary fork, gives an unpleasant flavor to the dish. For this reason, also, a knife should not be used in eating fish.

If asked whether you have a preference for any dish, or any particular part of a dish, answer plainly and distinctly as you wish.

Pay as much attention to your companion on your left, as politeness requires, but do not be unnecessarily officious.

People do not like to be stared at when eating. When you are helped to anything, do not wait until the rest of the company are provided. This is very common in the country, but shows a want of good breeding.

Do not allow your plate to be overloaded with a multifarious assortment of vegetables, but rather confine yourself to one kind. When you take another sort of meat, or a dish not properly a vegetable, you must change your plate.

If you have the honor of sitting on the right hand of the hostess, you will, immediately on the removal of soup, request the honor of taking wine with her.

Finally, to do all these things well, and to be au fait at a dinner party, be perfectly at your ease. To be at ease is a great step towards enjoying your own dinner, and making yourself agreeable to the company. Fancy yourself at home; performing all the ceremonies without any apparent effort. For the rest, observation and your own judgment will be the best guide, and render you perfect in the etiquette of the dinner table.

Condiments and Beverages.—Condiments are simply seasoning or flavoring agents, and, though hardly coming under the head of food, yet have an important part to play. As food by their use is rendered more tempting, a larger amount is consumed, and thus a delicate or uncertain appetite is often aided. In some cases they have the power of correcting the injurious character of some foods.

Salt stands foremost. Vinegar, lemon juice, and pickles owe their value to acidity; while mustard, pepper, black and red, ginger, curry-powder, and horseradish, all depend chiefly upon pungency. Under the head of aromatic condiments are ranged cinnamon, nutmegs, cloves, allspice, mint, thyme, fennel, sage, parsley, vanilla, leeks, onions, shallots, garlic, and others, all of them entering into the composition of various sauces in general use.

Salt is the one thing indispensable. The old Dutch law condemned criminals to a diet of unsalted food, the effects being said to be those of the severest physical torture. Years ago an experiment tried near Paris demonstrated the necessity of its use. A number of cattle were fed without the ration of

salt; an equal number received it regularly. At the end of a specified time, the unsalted animals were found rough of coat, the hair falling off in spots, the eyes wild and the flesh hardly half the amount of those naturally fed.

A class of extreme Grahamities in this country decry the use of salt, as well as any form of animal food; and I may add that the expression of their thought, in both written and spoken speech, is as savorless as their diet.

Salt exists, as we have already found, in the blood; the craving for it is a universal instinct, even buffaloes making long journeys across the plains to the salt-licks, and its use not only gives character to insipid food, but increases the flow of the gastric juice.

Black pepper, if used profusely, as is often done in American cooking, becomes an irritant, and produces indigestion. Red pepper, or cayenne, on the contrary, is a useful stimulant at times; but, as with mustard, any overuse irritates the lining of the stomach.

So with spices and sweet herbs. There should be only such use of them as will flavor well, delicately, and almost imperceptibly. No one flavor should predominate, and only a sense of general savoriness rule. Extracts, as of vanilla, lemon, bitter almond, etc., should be used with the greatest care, and if possible always be added to an article after it cools, as the heat wastes the strength. Tea is valuable chiefly for its warming and comforting qualities. Taken in moderation, it acts partly as a sedative, partly as a stimulant, arresting the destruction of tissue, and seeming to invigorate the whole nervous system. The water in it, even if impure, is made wholesome by boiling, and the milk and sugar give a certain amount of real nourishment. Nervous headaches are often cured by it, and it has, like coffee, been used as an antidote in opium-poisoning.

Pass beyond the point of moderation, and it becomes an irritant, precisely in the same way that an overdose of morphine will, instead of putting to sleep, for just so much longer time prevent any sleep at all. The woman who cannot eat, and who braces her nerves with a cup of green-tea,—the most powerful form of the herb,—is doing a deeper wrong than she

may be able to believe. The immediate effect is delightful. Lightness, exhilaration, and sense of energy are all there; but the reaction comes surely, and only a stronger dose next time accomplishes the end desired. Nervous headaches, hysteria in its thousand forms, palpitations, and the long train of nervous symptoms, own inordinate tea and coffee drinking as their parent. Taken in reasonable amounts, tea can not be said to be hurtful; and the medium qualities, carefully prepared, often make a more wholesome tea than that of the highest price, the harmful properties being strongest in the best. If the water is soft, it should be used as soon as boiled, boiling causing all the gases which give flavor to water to escape. In hard water, boiling softens it. In all cases the water must be fresh, and poured boiling upon the proper portion of tea, the teapot having first been well scalded with boiling water. Never boil any tea but English breakfast tea; for all others, simple steeping gives the drink in perfection.

The most valuable property of coffee is its power of relieving the sensation of hunger and fatigue. To the soldier on active service, nothing can take its place; and in our own army it became the custom often, not only to drink the infusion, but, if on a hard march, to eat the grounds also. In all cases it diminishes the waste of tissue. In hot weather it is too heating and stimulating, acting powerfully upon the liver, and, by producing over-activity of that organ, bringing about a general disturbance.

So many adulterations are found in ground coffee that it is safest for the real coffee-lover to buy the bean whole. Roasting is usually more perfectly done at the grocers', in their rotary roasters, which give every grain its turn; but, by care and constant stirring, it can be accomplished at home. Too much boiling dissipates the delicious aroma we all know; and the best methods are considered to be those which allow no boiling, after boiling water has been poured upon it, but merely a standing to infuse and settle. The old fashion, however, of mixing with an egg, and boiling a few minutes, makes a coffee hardly inferior in flavor. In fact, the methods are many, but results, under given conditions, much the same; and we may choose urn or old-fashioned tin pot, or a French

biggin, with the certainty that good coffee, well roasted, boiling water, and good judgment as to time, will give always a delicious drink. Make a note of the fact that long boiling sets free tannic acid, powerful enough to literally tan the coats of the stomach, and bring on incurable dyspepsia. Often coffee without milk can be taken, where, with milk, it proves harmful; but, in all cases, moderation must rule. Taken too strong, palpitation of the heart, vertigo, and fainting are the usual consequences.

In chocolate—a preparation of cocoa—the cocoa is carefully dried and roasted, and then ground to a smooth paste, the nuts being placed on a hot iron plate, and so keeping the oily matter to aid in forming a paste. Sugar and flavorings, as vanilla, are often added, and the whole pressed into cakes. The whole substance of the nut being used, it is exceedingly nutritious, and made more so by the milk and sugar added. Eaten with bread, it forms not only a nourishing but a hearty meal; and so condensed is its form, that a small cake carried in traveling, and eaten with a cracker or two, will give temporarily the effect of a full meal.

Alcohol is last upon our list, and scientific men are still uncertain whether or not it can in any degree be considered as a food; but we have not room for the various arguments for and against. You all know, in part, at least, the effects of intemperance; and even the moderate daily drinker suffers from clouded mind, irritable nerves, and ruined digestion.

This is not meant as an argument for total abstinence; but there are cases where such abstinence is the only rule. In an inherited tendency to drink, there is no other safe road; but to the man or woman who lives by law, and whose body is in the best condition, wine in its many forms is a permissible occasional luxury, and so with beer and cider and the wider range of domestic drinks. In old age its use is almost essential, but always in moderation, individual temperament modifying every rule, and making the best knowledge an imperative need. A little alcoholic drink increases a delicate appetite; a great deal diminishes or takes it away entirely, and also hinders, and, in many cases, stops, digestion altogether. In its constant over-use the membranes of the stomach are gradually

destroyed, and every organ in the body suffers. In ales and beers there is not only alcohol, but much nitrogeneous and sugary matter, very fattening in its nature. A light beer, well flavored with hops, is an aid to digestion, but taken in excess produces biliousness. The long list of alcoholic products it is not necessary to give, nor is it possible to enter into much detail regarding alcohol itself.

Soyer's Cafe au Lait.—One cup of best coffee, freshly roasted, but unground, two cups of boiling water, one quart of boiling milk. Put the coffee in a clean, dry kettle, or tin pail; fit on a close top, and set in a sauce-pan of boiling water. Shake it every few minutes, without opening it, until you judge that the coffee grains must be heated through. If, on lifting the cover, you find that the contents of the inner vessel are very hot and smoking, pour over them the boiling water directly from the tea-kettle. Cover the inner vessel closely, and set on the side of the range, where it will keep very hot, without boiling, for twenty minutes. Then add the boiling milk; let all stand together for five minutes more, and strain through thin muslin into the coffee urn. Use loaf sugars for sweetening.

Vienna Coffee.—With very little extra trouble morning coffee can be greatly improved. Beat the white of an egg to a stiff froth, mix with an equal quantity of whipped cream, and use in coffee instead of cream· put in cream first, then coffee, and lastly this mixture.

Good New England Coffee.—For a family of six, take six large tablespoonfuls of best Java coffee, well browned and ground (not too fine), beat into it half an egg and one cup of cold water. After it is thoroughly beaten, let it stand half an hour well covered. Then put into coffee-pot, pour on two and a half quarts of boiling water and put on the stove; stir once or twice at first, to prevent burning. Let it scald fifteen or twenty minutes. If desired to be very nice, beat up eight instead of six tablespoonfuls of coffee; put six in the pot to boil for twenty minutes, and about five minutes before it is done, throw in the rest and cover quickly.

Cream and Milk for Coffee.—Sweet, rich cream, well beaten to free from lumps, is best for coffee, but boiling fresh milk is

a good substitute. The white of an egg, thoroughly beaten and added (California coffee) to thin cream or rich milk, is also very fine.

Tea.—Tea is made variously as the taste of people require. Black, green, Japan, and English breakfast, all require different methods. For green or Japan tea, scald the tea-pot and allow from one-half to one teaspoonful for each person, as the strength of the herb may indicate. Pour over this one-half a cup of boiling water, steep in a hot place (but do not let it boil) ten minutes, then turn in water at a keen boil, in proportion one quart to every three persons.

English Breakfast, or Oolong.—Take two teaspoonfuls for three persons, and proceed as above, only letting the tea boil for ten minutes.

An English gentleman, whose tea was quite famous, put it to steep in cold water, as soon as the one o'clock dinner was over, and left it steeping until supper time, when it was brought to a boil. Others put it on to steep when the fire is made for supper, and let it stand until the meal is announced; served boiling hot.

Iced Tea.—To each glass of tea add the juice of half a lemon; fill up the glass with pounded ice, and sweeten.

Chocolate.—Four heaping tablespoonfuls grated chocolate, one of sugar, and wet with one of boiling water; rub this smooth. Then stir into one pint of boiling water; then add one pint of boiling milk. Let this boil three minutes. It is greatly improved by milling, while boiling, with a Dover egg-beater. If desired sweet, add to the boiling milk one heaping teaspoonful of sugar.

A dainty addition is two tablespoonfuls of whipped cream, that has been sweetened and flavored with vanilla, laid on the top of each cup.

Stock and Seasoning.—The preparation called stock is, for some inscrutable reason, a stumbling-block to average cooks, and even by experienced housekeepers is often looked upon as troublesome and expensive. Where large amounts of fresh meat are used in its preparation, the latter adjective might be appropriate; but stock in reality is the only mode by which

every scrap of bone or meal, whether cooked or uncooked, can be made to yield the last particle of nourishment contained in it. Properly prepared and strained into a stone jar, it will keep a week, and is useful in the making of hashes and gravies as in soup itself.

The first essential is a tightly-covered kettle, either tinned iron or porcelain lined, holding not less than two gallons; three being a preferable size. Whether cooked or uncooked meat is used, it should be cut into small bits, and all bones broken or sawn into short pieces. that the marrow may be easily extracted.

To every pound of meat and bone allow one quart of cold water, one even teaspoonful of salt, and half a saltspoonful of pepper. Let the meat stand till the water is slightly colored with its juice; then put upon the fire, and let it come slowly to a boil, skimming off every particle of scum as it rises. The least neglect of this point will give a broth in which bits of dark slime float about, unpleasant to sight and taste. A cup of cold water, thrown in as the kettle boils, will make the scum rise more freely. Let it boil steadily, but very slowly. allowing an hour to each pound of meat. The water will boil away, leaving, at the end of the time specified, not more than half or one-third the original amount. In winter this will become a firm jelly, which can be used by simply melting it, thus obtaining a strong, clear broth; or can be diluted with an equal quantity of water, and vegetables added for a vegetable soup

The meat used in stock, if boiled the full length of time given, has parted with all its juices, and is therefore useless as food. If wanted for hashes or croquettes, the portion needed should be taken out as soon as tender, and a pint of the stock with it, to use as gravy. Strain, when done, into a stone pot or crock kept for that purpose, and, when cold, remove the cake of fat which will rise to the top. This fat, melted and strained, serves for many purposes better than lard. If the stock is to be kept for several days, leave the fat on till ready to use it.

Fresh and cooked meat may be used together, and all remains of poultry or game, and trimmings of chops and steaks, may be added, mutton being the only meat which can not as

well be used in combination; though even this, by trimming off all the fat, may also be added. If it is intended to keep the stock for some days, no vegetables should be added, as vegetable juices ferment very easily. For clear soups they must be cooked with the meat; and directions will be given under that head for amounts and seasonings.

The secret of a savory soup lies in many flavors, none of which are allowed to predominate; and, minutely as rules for such flavoring may be given, only careful and frequent tasting will insure success. Every vegetable, spice, and sweet herb, curry-powders, catchups, sauces, dried or fresh lemon peel, can be used; and the simple stock, by the addition of these various ingredients, becomes the myriad number of soups to be found in the pages of great cooking manuals like Gouffee's or Francatelli's.

Brown Soups are made by frying the meat or game used in them till thoroughly brown on all sides, and using dark spices or sauces in their seasoning.

White Soups are made with light meats, and often with the addition of milk or cream.

Purees are merely thick soups strained carefully before serving, and made usually of some vegetable which thickens in boiling, as beans, peas, &c., though there are several forms of fish purees in which the foundation is thickened milk, to which the fish is added, and the whole then rubbed through a common sieve, if a regular puree sieve is not to be had.

Browned flour is often used for coloring, but does not thicken a soup, as, in browning, the starchy portion has been destroyed; and it will not therefore mix, but settles at the bottom. Burned sugar or caramel makes a better coloring, and also adds flavor. With clear soups grated cheese is often served, either Parmesan or any rich cheese being used. Onions give a better flavor if they are fried in a little butter or dripping before using, and many professional cooks fry all soup vegetables lightly. Cabbage and potatoes should be parboiled in a separate water before adding to a soup. In using wine or catchup, add only at the last moment, as boiling dissipates the flavor. Unless a thick vegetable soup is desired, always strain into the tureen. Rice, sago, macaroni, or any cereal may be used as

thickening; the amounts required being found under the different headings. Careful skimming, long boiling, and as careful removing of fat, will secure a broth especially desirable as a food for children and the old, but almost equally so for any age; while many fragments, otherwise entirely useless, discover themselves as savory and nutritious parts of the day's supply of food.

RECIPES.

Soups.—Beef Soup with Vegetables.—For this very excellent soup take two quarts of stock prepared before hand, as already directed. If the stock is a jelly, as will usually be the case in winter, an amount sufficient to fill a quart measure can be diluted with a pint of water, and will then be rich enough. Add to this one small carrot, a turnip, a small parsnip, and two onions; all chopped fine; a cupful of chopped cabbage; two tablespoonfuls of barley or rice; and either six fresh tomatoes sliced, or a small can of sealed ones. Boil gently at least one hour: then add one saltspoonful each of pepper, curry powder and clove. If the stock has been salted properly, no more will be needed; but tasting is essential to secure just the right flavors. Boil a few minutes longer, and serve without straining.

This is an especially savory and hearty soup, and the combinations of vegetables may be varied indefinitely. A cup of chopped celery is an exceedingly nice addition, or, if this is not to be had, a teaspoonful of celery salt, or a saltspoonful of celery seed. A lemon may also be sliced thin, and added at the last. When tomatoes are used, a little sugar is always an improvement; in this case an even tablespoonful being sufficient. If a thicker broth is desired, one heaped tablespoonful of cornstarch or flour may be first dissolved in a little cold water; then a cup of the hot broth gradually mixed with it, and the whole added to the soup and boiled for five minutes.

Perfect Mock Turtle Soup.—Endeavor to have the head and the broth ready for the soup, the day before it is to be eaten. It will take eight hours to prepare it properly.

	Hours.
Cleaning and soaking the head	1
To parboil it to cut up	1
Cooling, nearly	1
Making the broth and finishing the soup	5

Get a calf's head with the skin on (the fresher the better); take out the brains, wash the head several times in cold water, let it soak for about an hour in spring water, then lay it in a stewpan, and cover it with cold water, and half a gallon over; as it becomes warm, a great deal of scum will rise, which must be immediately removed; let it boil gently for one hour, take it up, and, when almost cold, cut the head into pieces about an inch and a half by an inch and a quarter, and the tongue into mouthfuls; or rather make a side dish of the tongue and brains.

When the head is taken out, put in the stock meat (about five pounds of knuckle of veal), and as much beef; add to the stock all the trimmings and bones of the head; skim it well, and then cover it close and let it boil five hours (reserve a couple of quarts of this to make gravy sauces); then strain it off and let it stand till the next morning; then take off the fat, set a large stewpan on the fire with half a pound of good fresh butter, twelve ounces of onions sliced, and four ounces of green sage; chop it a little; let these fry an hour; then rub in half a pound of flour, and by degrees add your broth till it is the thickness of cream; season it with a quarter of an ounce of ground allspice, and half an ounce of black pepper ground very fine, salt to your taste, and the rind of one lemon peeled very thin; let it simmer very gently for an hour and a half, then strain it through a hair sieve; do not rub your soup to get it through the sieve, or it will make it grouty; if it does not run through easily, knock your wooden spoon against the side of your sieve; put it in a clean stewpan with the head, and season it by adding to each gallon of soup two tablespoonfuls of Tarragon vinegar, and two tablespoonfuls of lemon juice; let it simmer gently till the meat is tender; this may take from half an hour to an hour; take care it is not overdone; stir it frequently to prevent the meat sticking to the bottom of the stewpan, and when the meat is quite tender the soup is ready.

A head weighing twenty pounds, and ten pounds of stock meat, will make ten quarts of excellent soup, besides the two quarts of stock you have put by for made dishes.

Observations.—If there is more meat on the head than you wish to put in the soup, prepare it for a pie, with the addition of a calf's foot boiled tender; it will make an excellent

ragout pie; season it with zest and a little minced onion, put in half a teacupful of stock, cover it with puff paste, and bake it one hour; when the soup comes from table, if there is a deal of meat and no soup, put it into a pie dish, season it a little, and add some little stock to it; then cover it with paste, bake it one hour, and you have a good mock-turtle pie.

To Season the Soup.—To each gallon put four tablespoonfuls of lemon juice, two of mushroom catsup, and one teaspoonful of mace, a teaspoonful of curry powder, or a quarter of a drachm of cayenne, and the peel of a lemon pared as thin as possible; let it simmer for five minutes more, take out the lemon peel, add the yolks of four hard boiled eggs, and the soup is ready for the tureen.

While the soup is doing, prepare for each tureen a dozen and a half of mock-turtle forcemeat balls, and put them into the tureen. Brain balls, or cakes, are a very elegant addition, and are made by boiling the brains for ten minutes, then putting them in cold water and cutting them into pieces about as big as a large nutmeg; take savory or lemon thyme dried and finely powdered nutmeg grated, and pepper and salt, and pound them all together; beat up an egg, dip the brains in it, and then roll them in this mixture, and make as much of it as possible stick to them; dip them in the egg again, and then in finely grated and sifted bread crumbs; fry them in hot fat, and send them up as a side-dish.

A veal sweet-bread, not too much done or it will break, cut into pieces the same size as you cut the calf's head, and put in the soup just to get warm before it goes to the table, is a superb "*bonne bouche;*" and pickled tongue, stewed till very tender, and cut into mouthfuls, is a favorite addition. We order the meat to be cut into mouthfuls that it may be eaten with a spoon; the knife and fork have no business in a soup plate.

N. B.—In helping this soup, the distributer of it should serve out the meat, forcemeat and gravy in equal parts; however trifling and needless this remark may appear, the writer has often suffered from the want of such a hint being given to the soup-server, who has sometimes sent a plate of more gravy without meat, at others, of meat without gravy, and sometimes scarcely anything but forcemeat balls.

OBSERVATIONS.—This is a delicious soup within the reach of those who "eat to live;" but if it had been composed expressly for those who only "live to eat," I do not know how it could have been more agreeable; as it is, the lover of good eating will "wish his throat a mile long, and every inch of it a palate."

SUMMER OR WINTER CORN SOUP.—Boil a leg of mutton or shank of beef in six quarts of water for four hours. After the meat and fat have been removed (it is better to stand over one day to cool, so that the grease may all be taken off), add a quart or more of sweet corn nicely cut from the cob, and boil twenty or thirty minutes. In cutting the corn (with a sharp knife) take off only the point of the kernels, and scrape the milk or pulp, thus avoiding the hull or skin, which is indigestible and unpalatable. Just before serving, add to the soup a coffee-cup of cream, with two tablespoonfuls of flour stirred smoothly in and boil for a minute. This can be made in winter by using the Yarmouth canned corn or the dried corn soaked over night, and boiled till tender.

CORN SOUP.—Cut the grains from twelve ears of sweet corn and scrape the milk; add one pint of water. Let it boil until quite done—thirty to forty minutes—then add two quarts of new milk, and when it boils stir in one-quarter pound of butter rubbed into two tablespoonfuls of flour, pepper and salt. Beat the yolks of two eggs in the tureen and pour the soup in boiling, stirring all the time.

TURKEY SOUP.—Place the rack of a cold turkey and what remains of dressing or gravy in a pot, and cover with cold water. Simmer gently three or four hours, and let it stand until the next day. Take off what fat may have risen, and take out with a skimmer all the bits of bones. Put the soup on to heat till boiling, then thicken slightly with flour wet up in water, and season to the taste. Pick off all the turkey from the bones, put them in the soup, boil up and serve.

CALF'S HEAD SOUP.—Take the head, pluck and feet. Put them into a pot with cold water. Be careful to skim well when it boils. Chop a dozen small onions and let them all boil together until the meat cleaves from the bones. Then strain

it. After putting the liquor into the pot again, add thyme, cloves, salt, pepper and cayenne to your taste. But all the meat from the head and feet, half the liver and lights, the whole of the heart and tongue; put all into the pot and boil about three-quarters of an hour. Before it is done take half a pound of butter with as much flour as will make into balls; stir until dissolved. Then add two tablespoonfuls of tarragon vinegar, four hard boiled eggs cut in slices, and a lemon to improve the flavor. This will make two gallons, and may be kept several weeks, to be used as occasion requires.

Tomato Soup.—One quart of water, eight good-sized ripe tomatoes cut up; boil twenty minutes and add one half teaspoonful of soda; then boil and add one pint or more of milk, and season as you do oysters.

Black Bean Soup.—One quart of black beans, soaked over night in four quarts of water, one pound of beef, half pound of salt pork. Grate one large or two small carrots, and slice one large onion, and add to the beans and the water in which they were soaked. Boil all together for three or four hours, then strain through a colander. When in the tureen add one tablespoonful of mushroom sauce, one sliced lemon and one sliced or chopped boiled egg.

Pea Soup.—Soak one quart of peas (split, if you can get them) over night; next morning early put them over the fire with one pound of corned beef or pork (beef is the best to my taste, however), and let them boil hard for three hours. Then add a chopped carrot and turnip, and an onion, if liked, a teaspoonful of celery seed or a handful of celery tops, and boil another hour or more; then strain through a sieve, season with pepper, and cut up two thin slices of toasted bread in the shape of small dice; put in the tureen, turn on your soup and serve. A cup of milk boiled in it for twenty minutes is an improvement. Small, white beans can be substituted for peas and made in the same manner.

Oyster Soup.—For four cans of oysters, have twelve crackers rolled fine, two quarts of boiling water, one pint of good rich milk. Let the milk and water come to a boil, add the crackers, salt and pepper, boil one minute briskly; pour in the

oysters and let all come to a scald; add about a quarter of a pound of butter as they are poured into a tureen.

Oyster Soup, No. 2.—To one quart of oysters add one quart of water: pour the water on the oysters and stir them; take them out one at a time, so that no small particle of shell may adhere to them; strain the liquor through a sieve and put it in a stew-pan over the fire, with two or three blades of mace, and season with red pepper and salt to taste; when this boils put in your oysters, add a teaspoonful of flour rubbed to a paste with one ounce of butter; let them scald again, then add one half pint of cream and serve hot.

Fish.—The most essential point in choosing fish is their freshness, and this is determined as follows: If the gills are red, the eyes prominent and full, and the whole fish stiff, they are good; but if the eyes are sunken, the gills pale and the flesh flabby, they are stale and unwholesome, and, though often eaten in this condition, lack all the fine flavor of a freshly-caught fish.

The fish being chosen, the greatest care is necessary in cleaning. If this is properly done, one washing will be sufficient; the custom of allowing fresh fish to lie in water after cleaning destroys much of their flavor.

Fresh-water fish, especially the cat-fish, have often a muddy taste and smell. To get rid of this, soak in water strongly salted; say a cupful of salt to a gallon of water, letting it heat gradually in this, and boiling it for one minute; then drying it thoroughly before cooking.

All fish for boiling should be put into cold water, with the exception of salmon, which loses its color unless put into boiling water. A tablespoonful each of salt and vinegar to every two quarts of water improves the flavor of all boiled fish, and also makes the flesh firmer. Allow ten minutes to the pound after the fish begins to boil, and test with a knitting needle or sharp skewer. If it runs in easily, the flesh can be taken off. If a fish-kettle with strainer is used, the fish can be lifted out without danger of breaking. If not, it should be thoroughly dredged with flour, and served in a cloth kept for the purpose. In all cases drain it perfectly, and send to table on a folded napkin laid upon the platter.

In frying, fish should, like all fried articles, be immersed in the hot lard or drippings. Small fish can be fried whole; larger ones boned, and cut in small pieces. If they are egged and crumbed, the egg will form a covering, hardening at once, and absolutely impervious to fat.

Pan-fish, as they are called—flounders and small fish generally—can also be fried by rolling in Indian meal or flour, and browning in the fat of salt pork.

Baking and broiling preserve the flavor most thoroughly.

Cold boiled fish can always be used, either by spicing as in the rule to be given, or by warming again in a little butter and water. Cold fried or boiled fish can be put in a pan, and set in the oven till hot; this requiring not over ten minutes; a longer time giving a strong oily taste, which spoils it. Plain boiled or mashed potatoes are always served with fish where used as a dinner course. If fish is boiled whole, do not cut off either tail or head. The tail can be skewered in the mouth if liked; or a large fish may be boiled in the shape of a letter S by threading a trussing-needle, fastening a string around the head, then passing the needle through the middle of the body, drawing the string tight, and fastening it around the tail.

To Fry or Broil Fish Properly.—After the fish is well cleansed, lay it on a folded towel and dry out all the water. When well wiped and dry, roll it in wheat flour, rolled crackers, grated stale bread, or Indian meal, whichever may be preferred; wheat flour will generally be liked.

Have a thick-bottomed frying-pan or spider with plenty of sweet lard salted (a tablespoonful of salt to each pound of lard), for fresh fish which have not been previously salted; let it become boiling hot, then lay the fish in and let it fry gently, until one side is a delicate brown, then turn the other; when both are done take it up carefully and serve quickly, and keep it covered with a tin cover, and set the dish where it will keep hot.

To Broil.—Have a clean gridiron, and a clear but not fierce fire of coals; rub the bars with a bit of beef suet, that the fish may not stick; fish must be broiled gently and thoroughly. There are few things more offensive than undone fish.

For the broil, have ready a dish with a good bit of butter in which is worked a little salt and pepper, enough for the fish. Lay the fish upon it, when both sides are nicely done, and with a knife-blade put the butter over every part; fish should be turned with a broad-bladed knife or a pancake turner.

All salt fish require to be soaked in cold water before cooking, according to the time it has been in salt. When it is hard and dry it will require thirty-six hours soaking before dressing; the water must be changed three or four times. When fish is not very salt or hard, twenty-four hours will be sufficient.

For frying fish, beef suet or dripping or sweet oil may be used in place of lard. Butter is not good; it spoils the color and tastes strong.

Fish have a fine appearance prepared in the following manner: Clean and wash them, and wipe them dry with a nice soft towel; then wet them over with beaten egg, and dip them in bread crumbs or rolled crackers. If done twice over with egg and cracker or crumbs, it will have a finer appearance.

The largest sized pan fish, weighing nearly or quite a pound each, should be scored or cut across each side from the head to the tail, nearly to the bone, and about an inch apart, that it may be well done. Garnish with sprigs of parsley. Have ready a thick-bottomed frying pan, with plenty of lard salted; let it become boiling hot; lay the fish carefully in and let them fry gently, until one side is a rich yellow brown, then turn the other and do likewise; when both are done, take them carefully up on a hot dish and serve. Garnish with fried parsley.

Dried Codfish.—This should always be laid in soak, at least one night before it is wanted; then take off the skin and put it in plenty of cold water; boil it gently (skimming it meanwhile) for one hour, or tie it in a cloth and boil it. Serve it with egg sauce; garnish with hard boiled eggs cut in slices, and sprigs of parsley. Serve plain boiled or mashed potatoes with it.

Stewed Salt Cod.—Scald some soaked cod by putting it over the fire in boiling water for ten minutes; then scrape it white, pick it in flakes, and put it in a stewpan, with a tablespoonful of butter worked into the same of flour, and as

much milk as will moisten it; let it stew gently for ten minutes; add pepper to taste, and serve hot; put it in a deep dish, slice hard boiled eggs over it, and sprigs of parsley around the edge.

This is a nice relish for breakfast, with coffee and tea, and rolls or toast.

Codfish Cakes.—First boil soaked cod, then chop it fine, put to it an equal quantity of potatoes boiled and mashed; moisten it with beaten eggs or milk, and a bit of butter and a little pepper; form it in round small cakes, rather more than half an inch thick, flour the outside, and fry in hot butter or beef drippings until a delicate brown. Like fish, these must be fried gently, the lard being boiling hot when they are put in; when one side is done turn the other. Serve for breakfast.

To Bake a Dish of Cold Boiled Cod.—Chop fine some cold boiled cod, put to it an equal quantity or more of boiled potatoes chopped and mashed; add a good bit of butter and milk to make it moist, and put it in a stewpan over a gentle fire; cover it, and stir it frequently until it is thoroughly heated, taking care that it does not burn; then take it up, make it in a roll or any other form, mark the surface, take a pinch of ground pepper between your finger and thumb, and put spots at equal distances over it; or wet it over with melted butter, and brown it in an oven before the fire.

Fresh Cod.—Fresh cod, when good, are firm, and the gills red, and the eyes are full; if at all soft and flabby it is not good. A fine fish is thick at the back; the shoulder or piece near the head of a large cod is better for boiling than a small fish.

To Boil Fresh Cod.—If you have not a fish kettle, after cleaning the fish properly, lay it on a plate in a circle, and tie a clean towel about it; to a gallon of hot water put a tablespoonful of salt and a gill of vinegar; put in the fish and boil according to its weight. Serve with plain boiled potatoes and drawn butter, parsley, or egg sauce. Garnish with sprigs of parsley. Lay a folded napkin on the dish under the fish.

Fried Codfish Steaks.—Cut the fish in steaks of about

one inch thickness; or it may be split as for broiling; dip each piece in wheat flour or rolled cracker, or Indian meal; have some lard, (which is salted in proportion, a tablespoonful of salt to a pound,) let it become boiling hot in a frying pan; lay in the steaks; let them fry gently, without stirring them, until one side is a fine brown, then turn each steak carefully with a broad knife; when both sides are done, serve hot, with sprigs of parsley over it.

Baked Cod.—Clean a good sized fish, weighing four or five pounds; wash it and dry it well in a cloth; rub it inside and out with a mixture of pepper and salt; cut a slice from a loaf of bread, spread it thickly with butter; moisten it with hot water, and fill the body of the fish; tie a thread around it to keep the dressing in, then put bits of butter, the size of a hickory nut, all over the surface; dredge flour over it until it looks white; then lay a trivet on some muffin rings in a dripping-pan, and lay the fish on; put in a pint of water to baste with, then put it in a hot oven, and baste frequently; in one hour it will be done. Take it up on a hot dish, add a gill of vinegar to the gravy, or a lemon cut in very thin slices; dredge in a little flour; let it boil up once; stir it well; add a very little hot water if necessary, then strain into a gravy-boat, lay the slice over the fish, and serve.

Haddock.—These are chosen and dressed the same as cod.

Shad.—These are in season from the last of March until May; they are chosen by the same rules as other fish.

These fish may be fried, baked, boiled or salted.

Fried Shad.—Scale the fish, and cut off the head, then split it open down the back, at the side of the backbone; take out the entrails; keep the roe or eggs to be fried with the fish; then cut it in two from head to tail, and cut each side in pieces two or three inches wide; rinse them in cold water, wipe them dry, and dip each in wheat flour, and fry in salted lard; when the inside, which must always be cooked first (of any fish), is done a fine brown, turn the other; the fat must be boiling hot when the fish is put in, and then fried gently, that it may not be too dark colored.

Broiled Shad.—Cut the fish the same as for frying, or

merely split it in two; lay it on a gridiron over a bright steady fire of coals; let it broil gently; put the inside to the fire first that it may be done through; have ready a steak dish with nearly a quarter of a pound of sweet butter, and a teaspoonful of salt and pepper each, worked into it; when both sides of the fish are done, lay it on the dish, turn it several times in the butter, cover it with a tin cover, and set the dish where it will keep hot, until ready to serve.

Baked Shad.—Scale the shad clean, cut off the head, and split the fish half way down the back; scrape the inside perfectly clean; make a stuffing thus: Cut two slices of a baker's loaf of wheat bread, spread each thickly with butter; sprinkle with pepper and salt, and a little pounded sage if liked; moisten it with hot water; fill the belly with this; wind a cord around it to keep in the stuffing, dredge the outside well with flour; stick bits of butter, the size of a hickory nut, all over outside; mix a teaspoonful each of salt and pepper together, and sprinkle it all over the whole surface; then lay the fish on a trivet or muffin rings in a dripping pan; put in a pint of water to baste with, and keep the gravy from burning; if this all wastes before the fish is done, add more hot water; bake for one hour in a quick oven; baste frequently. When done, take the fish on a steak dish; if there is not enough gravy in the pan (there should be at least half a pint), add more hot water; dredge in a heaping teaspoonful of flour, then put to it a bit of butter, and, if liked, a lemon sliced thin, and the seeds taken out. Stir it smooth with a spoon, and pour it through a gravy-strainer into a gravy-boat; lay the slices of lemon over the fish, and serve with mashed potatoes.

To Fry Black Fish.—Scale the fish, and scrape the inside clean to the backbone; wash in water, with a little vinegar; wipe it dry with a clean towel; then dip it in wheat flour, or rolled crackers. Have in a thick-bottomed frying pan plenty of lard salted (a large tablespoonful of salt to a pound of lard), let it become boiling hot; then lay in the fish and fry it gently, until one side is a fine brown; then turn it carefully. When both sides are done, take it up and serve.

Fried fish may be garnished or ornamented with sprigs of green or fried parsley, or thin slices of lemon, sliced.

Stewed Black Fish.—Put a fish weighing about five pounds on a fish-drainer; after having properly cleansed it, put it into the fish-kettle with hot water to cover it; add to it a few blades of mace, a large teaspoonful of salt, and a wineglass of port wine; let it simmer or boil gently for half an hour; then skim it clear; work into a smooth mass a quarter of a pound of sweet butter, and a heaping tablespoonful of wheat flour; take from the fish part of the water in which it was boiled, leaving it scarcely covered; then add the flour and butter, with a teaspoonful of pepper; dip a bunch of parsley into boiling water, cut it small and add it to the stew; cover it close for twenty minutes, and let it simmer gently; then take the fish up on a dish, and serve with the gravy or sauce over. A sliced lemon without the pits may be added with the parsley by those who like it. Served with plain boiled or mashed potatoes. Black fish dressed in this manner is very delicious.

Perch.—Clean these fish well, wash and wipe them dry, then fry them as directed.

Striped Bass.—These fish are best fried or boiled. See directions for boiling or frying fish.

Halibut.—This fish is fine, whether cut in steaks and broiled or fried; or the thick part boiled. Fry or broil as directed for codfish. Steaks or fillets cut from the tail part are very fine, and may be fried or broiled more nicely than any other.

To Boil Halibut.—Take a piece weighing four or five pounds, scrape the skin clean, dredge flour over it, and boil according to its weight—ten minutes to a pound. Serve with plain boiled potatoes, and drawn butter, or egg, or parsley sauce. Cold boiled halibut may be served the same as codfish; any of the sauce which may remain may be put with the cold fish.

Salmon.—When salmon is fresh and good, the gills and flesh are of a bright red, the scales clear, and the fish stiff. When first caught, there is a whiteness between the flakes, which, by keeping, melts down, and the fish becomes richer. Salmon requires to be well broiled. When underdone it is unwholesome.

Broiled Salmon.—Cut some slices about an inch thick, and broil them over a gentle, bright fire of coals for ten or twelve minutes. When both sides are done, take them on to a hot dish; butter each slice well with sweet butter; strew over each a little salt and pepper to taste, and serve.

Spiced Salmon (Pickled).—Boil a salmon, and, after wiping it dry, set it to cool; take of the water in which it was boiled, and good vinegar each equal parts, enough to cover it; add to it one dozen cloves, as many small blades of mace, or sliced nutmeg, one teaspoonful of whole pepper, and the same of allspice; make it boiling hot, skim it clear, add a small bit of butter (the size of a small egg), and pour it over the fish; set it in a cool place. When cold it is fit for use and will keep a long time, covered close, in a cool place. Serve instead of pickled oysters for supper. A fresh cod is very nice done in the same manner; as is also a striped sea bass.

Boiled Salmon.—Run a long needle with a packthread through the tail, centre and head of a fish, to bring it in the form of a letter S. Put it in a fish-kettle, with hot water to cover it, and a teaspoonful of salt (cut three or four slanting gashes in each side of the fish before making it into the form, otherwise the skin will break and disfigure it); allow ten minutes gentle boiling for each pound of fish. Or a piece of a large fish may be boiled. Serve with lobster, or anchovey, or draw butter sauce, and plain boiled or mashed potatoes.

A Dish of Salt Salmon.—Salmon is often put down in brine. It is to be soaked and boiled, as directed for salt cod-fish, or it may be boiled for breakfast. Or pull off the skin, and pick in flakes the thickest side of a salmon; pour scalding hot water over it, let it stand for a few minutes; then pour it off; add to it enough milk or hot water to moisten it; put it over the fire and let it simmer for five minutes; then add a tablespoonful of butter, shake over it a little wheat flour and pepper to taste, stir it for a few minutes, and it is done. A fine relish for breakfast or supper.

Eels.—Eels, to be good, must be as fresh caught as possible; skin them, cut off the heads, cut them open and scrape them clean to the back bone.

For frying or boiling, the middle-sized fat ones are best;

those caught in fresh water have a muddy taste, and should be put in salted water a short time before cooking. Eels may be boiled and served with drawn butter or parsley sauce, and boiled potatoes.

FRIED EELS.—After cleaning the eels well, cut them in pieces two inches long; wash them and wipe them dry; roll them in wheat flour or rolled cracker, and fry as directed for other fish, in hot lard or beef dripping, salted. They should be browned all over and thoroughly done.

FRESH MACKEREL.—These fish to be good must be cooked as soon as possible after they are caught. They may be broiled, fried, or baked, the same as shad—also salted.

DRIED MACKEREL.—Take fresh caught mackerel, scale them and cut them down the back to the tail; leave the heads on; then hang them by the tail in a cool place to drain; strew some salt on the bottom of the pan; sprinkle the fish plentifully with it, and lay them two by two, the insides together, in a pan; let them lie twelve hours, then rinse off the salt and hang them to drain for half an hour, after which pepper the insides a little and lay them on stones, aslant towards the sun, to dry; take care never to put them out when the sun is not hot on them, nor until the stones are heated and dry; lay the insides to the sun—they will be perfectly cured in one week; stretch them open with two sticks. Or, instead of drying, after having prepared them in this manner, smoke them.

SALT MACKEREL.—Split fresh caught mackerel down the back, scrape the inside clean, spread them open on a board, and strew them plentifully with salt; then strew salt over the bottom of a tub; lay the fish two by two, the insides together, and lay them in the tub; strew salt between each layer; half coarse and half fine salt; then cover them close—put plenty of salt above the last layer of fish.

TO DRESS SALT MACKEREL.—Take mackerel from the salt, and lay them inside downward in a pan of cold water for two or three days, change the water once or twice, and scrape the fish clean without breaking it. When fresh enough, wipe one dry and hang it in a cool place; then fry or broil, or lay one in a shallow pan, the inside of the fish down; cover it with hot water, and set it over a gentle fire or in an oven for twelve or

fifteen minutes; then pour off the water, turn the fish, put bits of butter in the pan, and over the fish, sprinkle with pepper, and let it fry for five minutes, then dish it.

Trout.—These may be stewed, fried, boiled, or baked.

Pike or Pickerel.—These may be stewed, fried or broiled.

There are many more fine fish not mentioned herein, but as the process of stewing, boiling, broiling, and frying is very nearly the same for all sorts of fish, it does not seem necessary to mention more.

Herrings.—These are eaten in three varieties—fresh, salted, smoked, or red herrings. Salted herrings are to be soaked in clean water before boiling, the same as mackerel. Red herrings are to be skinned, split in two, and the insides and the backbone to be taken out; or they may first be broiled, then skinned. To cook fresh herrings, scale and prepare them the same as any other fish.

Chowder.—Slice some salt pork very thin, strew it over with onions chopped small, and some fine pepper; then cut a haddock, fresh cod, or any other firm fish, in thin steaks; take out the bones; lay some of the sliced pork at the bottom of the kettle with some of the seasoning; then put a layer of fish, then put over some soaked crackers or biscuit, then another layer of the seasoned pork, after which fish and crackers and a few bits of butter, and so on alternately, pork, fish and crackers, until the kettle is two-thirds full; then put in about a pint of water, and cover the pot with a thick iron cover with a rim; set it over a gentle fire, put coals and ashes on the cover, and bake two or three hours, or more, if the pot is large. When done, turn it out on a dish and serve with pickles. It may be baked in an oven.

Shell Fish.—To Choose Lobsters.—These are chosen more by weight than size; the heaviest are best. A good small sized one will not unfrequently be found to weigh as heavily as one much larger. If fresh, a lobster will be found lively, and the claws have a strong motion when the eyes are pressed with the finger. Hen lobsters are preferred for sauce or salad, on account of their coral. The head and small claws are never used.

To Boil Lobsters.—Put in a large kettle water enough to cover the lobster, and salt—a dessertspoonful to a quart of water; when it boils fast put in the lobster, head first, which kills it instantly; keep boiling briskly for half an hour, then take it from the water with the tongs and lay it to drain; wipe off the scum from it and rub it over with a bit of butter tied in a cloth, or some sweet oil; break off the large claws, and crack each shell without shattering, but so that they may come easily to pieces; lay a napkin on a large steak dish; with a sharp knife split the body from head to tail, and lay it open on the napkin; put a large claw at either end, and serve with melted butter sauce. Or else take out all the meat from the shells, and lay it neatly on a dish, and serve with melted butter.

Lobster Salad.—Break apart one or two heads of white heart lettuce, lay the leaves in cold water, rinse them well, then shake the water from each leaf, and lay them, the largest first, in a salad bowl, the stalk inwards. Lay the delicate small leaves around the edge; or cut it all small before putting it in the bowl.

Having boiled a hen lobster, take the meat from the shell and cut it small; rub the coral to a smooth paste, with the green inside if liked, and a tablespoonful of oil or melted butter; add to it a teaspoonful of made mustard, and a saltspoonful of black pepper; add a gill of sharp vinegar; stir it smooth, then mix it with the minced lobster and salad, and serve with cold butter and crackers or rolls. The lobster and dressing must not be put with the lettuce until ready to serve.

To Choose Crabs.—If fresh, the joints of the claws will be stiff, and the inside have an agreeable smell; the heaviest for their size are best; the light ones are watery. Crabs are stale when the eyes look dull.

To Boil Crabs.—Have a pot of boiling water in which is salt (a tablespoonful to the quart), throw the crabs in and keep them boiling briskly for twelve minutes, if large; then take them out, wipe the shells clean, and rub them over with a bit of butter; break off the small claws, spread a napkin on a large dish, and lay the crabs on it in regular rows, beginning at the outside. Serve with cold butter and rolls.

To Boil Soft Shell Clams.—Wash the shells clean, and put the clams, edges downwards, in a kettle; then pour about a quart of boiling water over them; cover the pot and set it over a brisk fire for three quarters of an hour. Pouring boiling water over them causes the shells to open quickly and let out the sand which may be in them. Take them up when done; take off the black skin which covers the hard part, trim them clean, and put them in a stewpan; put to them some of the liquor in which they were boiled; put to it a good bit of butter, and pepper and salt to taste; make them hot; serve with cold butter and rolls.

To Fry Soft Shell Clams.—Get them from the shell, as they are very troublesome to clean; wash them in plenty of water, and lay them on a thickly folded napkin to dry out the water; then roll a few at a time in wheat flour, until they will take up no more; have a thick bottomed frying pan one-third full of boiling hot lard, and salted (in proportion, a tablespoonful of salt to a pound of lard); lay the clams in with a fork, one at a time; lay them close together and fry gently, until one side is a delicate brown; then turn carefully and brown the other; then take them off on a hot dish. When fried properly, these clams are very excellent.

Hard Shell Clams.—Hard shell clams may be prepared for table in a variety of ways. The sand clams, either large or small, are preferable to any other, being whiter and more tender. Those called Quahogs are least delicate eating of all.

To Boil Hard Shell Clams.—Wash the shells until they are perfectly clean, then put them into a kettle, with the edges downwards; add a pint of water, cover the pot and set it over a brisk fire; when the shells open wide they are done. Half an hour is generally enough for them; if a strong taste to the juice is not liked, put more than a pint of water to them. When done, take the clams from the shells into a deep dish; put to them some of the juice, a good bit of butter, and some pepper, or toast some thin slices of bread, butter them and cut them small, and put them in the dish before putting in the clams and juice.

Stewed Clams.—Take fifty large sand clams from their

shells, and put to them their own liquor and water in equal parts, nearly to cover them; put them in a stewpan over a gentle fire for half an hour; take off any scum as it rises, then add to them a teacup of butter in which is worked a tablespoonful of wheat flour, and pepper to taste; cover the stewpan, and let them simmer for fifteen minutes longer, then serve. Pour it over toast if preferred. Substituting milk for water makes them more delicate and white. Any other than sand clams, require one hour to stew; that is, three-quarters of an hour before putting in the seasoning.

Fried Hard Shell Clams.—Get the large sand clams; wash them in their own liquor; dip them in wheat flour or rolled crackers, as may be preferred, and fry in hot lard or beef dripping, without salt; or dip each one in batter made as for clam fritters.

Clam Chowder.—Butter a deep tin basin, strew it thickly with grated bread crumbs or soaked crackers; sprinkle some pepper over, and bits of butter the size of a hickory nut, and, if liked, some finely chopped parsley; then put a double layer of clams, season with pepper, put bits of butter over, then another layer of soaked cracker; after that clams and bits of butter; sprinkle pepper over, add a cup of milk or water, and lastly a layer of soaked crackers. Turn a plate over the basin, and bake in a hot oven for three-quarters of an hour; use half a pound of soda biscuit, and a quarter of a pound of butter with fifty clams.

Oysters.—Oysters must be fresh and fat to be good. They are in season from September to May.

The small ones, such as are sold by the quart, are good for pies, fritters, or stews; the largest of this sort are nice for frying or pickling for family use.

Oyster Fritters.–Take a quart of oysters from their own liquor, strain it and add to it half a pint of milk and two well beaten eggs, stir in it by degrees flour enough to make a smooth but rather thin batter; when perfectly free from lumps put the oysters to it, have some lard or beef dripping made hot in a frying pan, salt it a little, and when it is boiling hot put in the butter with a large spoon, having one or more oysters in each;

hold it over a gentle fire until one side is a delicate brown—turn each fritter separately. When both sides are done, take them on a hot dish and serve for breakfast or supper.

Fried Oysters.—Take large oysters from their own liquor into a thickly folded napkin to dry them off; then make a tablespoonful of lard or beef fat hot, in a thick-bottomed frying pan, add to it a half saltspoonful of salt; dip each oyster in wheat flour, or cracker rolled fine, until it will take up no more, then lay them in the pan, hold it over a gentle fire until one side is a delicate brown; turn the other by sliding a fork under it; five minutes will fry them after they are in the pan. Oysters may be fried in butter, but it is not so good; lard and butter half and half is very nice for frying. Some persons like a very little of the oyster liquor poured in the pan after the oysters are done; let it boil up, then put it in the dish with the oysters; when wanted for breakfast this should be done.

Broiled Oysters.—Take the large oysters from their own liquor, lay them on a folded napkin to dry off the moisture, then dip each one in wheat flour or rolled cracker, or first into beaten egg and then into rolled cracker; have a gridiron made of coarse wire, put it over a bright but not fierce fire of coals, lay the oysters carefully on; when one side is done turn the other, put some sweet butter on a hot plate, sprinkle a little pepper over, lay the oysters on and serve with crackers.

To Stew Oysters.—Put the oysters with the broth to boil, and when they begin to curl, skim them out of the kettle into a pan of cold water; let them lie in the water until the broth has been skimmed and seasoned with butter, salt and pepper, add mace if you like; then drain off the water and return the oysters to the broth. When they begin to boil up again they are ready to serve, and will be found to be more plump and hard by the process.

Griddled Oysters.—Heat a griddle very hot, butter it and lay oysters all over it; when brown on one side, turn as you do griddle cakes. They should be washed first from the liquor, and this must be boiled and skimmed, and turned over the oysters when served, first seasoning it with butter, salt and pepper; serve on bread or cracker toast.

Panned Oysters.—Take the oysters from their liquor, and

put them in a saucepan or spider that is hot. Let them cook quickly, season with salt and pepper, and a little butter, and lay upon toast. A little juice will exude from the oysters while cooking, which will keep them from getting too dry, and they will prove very palatable to all who will try it.

To Fry Oysters with Batter.—Take fine large oysters, beat as many eggs with cream (say two eggs to a cup of cream) as will moisten all the oysters required; dip the oyster thoroughly into this mixture and then cover well with cracker crumbs which have been seasoned with salt, pepper and a little mace, if desired. Put into your frying pan or spider equal quantities of butter and lard, and when hot fry the prepared oysters to a delicate brown tint and serve hot. If preferred, add three tablespoonfuls of flour to the eggs and cream, and omit the cracker crumbs.

Oysters Broiled on the Shell.—The oysters should be of the largest size. Clean the shells with a stiff brush, then open and save the juice; turn boiling water over the oysters for only a minute or two; drain it off, and lay the oysters on one-half of the shell, putting it on a well-heated gridiron over a very hot fire. Boil the liquor that came from the oysters when opened, add it to the shell with a sprinkle of salt, pepper, and a bit of butter, serve hot on the shells, laid on large platters.

Unsurpassed Fricasseed Oysters.—For one can of oysters use one pint of thin cream; clean all the liquor from the oysters and put them over steam until hot; at the same time thicken the cream with flour and season with salt, pepper and a small pinch of mace, and the same of cinnamon and a very little butter; cook this well, and when done thoroughly, add to it the liquor of the oysters which has been scalded and well skimmed until clear; then add the oysters, letting them remain just long enough to get plump (if left too long they grow tough). Have ready some toast on a platter and pour the whole over it, or have leaves and triangles of rich paste around the dish and partially moistened by the fricassee. Your platter must be very hot, as fricasseed oysters chill like a newborn baby.

Oyster Pie.—Two cans of oysters, or three pints of solid

oysters, one quart of cream, one dozen rolled crackers, pepper, salt, etc. Stir all together and pour into a dish lined with thick puff paste, cover with another paste and bake three-quarters of an hour. This is a delicious mode of cooking oysters.

Oyster Patties.—Put the oysters in a saucepan with enough of the liquor to cover them; let them come to a boil, skim well, add two teaspoonfuls of butter for one quart of oysters, season with pepper and a little salt. Two or three spoonfuls of cream will add to the richness. Have ready small tins lined with puff-paste; put three or four oysters in each, according to the size of the patty; cover with paste and bake in a quick oven twenty minutes; when done wash over the top with beaten egg and set in the oven for two minutes to glaze.

Scalloped Oysters.—Have plenty of fine crushed cracker crumbs—either soda or butter crackers; put a layer in the bottom of a buttered pudding dish; wet slightly with oyster liquor and milk, mixed; next a layer of oysters; season with salt and pepper and small bits of butter; then more crumbs and oysters, alternately, until the dish is full. Let the top layer be of crumbs. Beat an egg and mix it with a little milk to pour over the top; place little lumps of flour all over the top, cover the dish and bake half an hour; remove the cover a few minutes before taking from the oven to let it brown.

Chicken and Oyster Croquettes.—Take equal quantities of chicken and oysters, chopped fine, with a cup of sifted bread crumbs and a piece of butter; season with salt and pepper, and, if liked, a little mace. Moisten with one or two well beaten eggs. Form into long, slender rolls, and fry in lard to a light brown; serve on a napkin, and garnish with celery tops or parsley, and slices of lemon.

Pickled Oysters.—Strain the liquor from the oysters; boil and skim until clear; drop in the oysters and let them come to a boil; skim them out and put them in a jar. Take about half the liquor remaining, add vinegar until it tastes sharp, a few whole cloves and allspice; boil and pour over the oysters hot; cover them and let them stand two or three days before using. If you wish to use them any sooner take a little more vinegar.

Sauces and Salads.—The foundation for a large proportion of sauces is in what the French cook knows as a *roux*, and we as "drawn butter." As our drawn butter is often lumpy, or with the taste of the raw flour, we give the French method as a security against such disaster.

To Make a Roux.—Melt in a saucepan a piece of butter the size of an egg, and add two even tablespoonfuls of sifted flour; one ounce of butter to two of flour being a safe rule. Stir till smooth, and pour in slowly one pint of milk, or milk and water, or water alone. With milk it is called *cream roux*, and is used for boiled fish and poultry. Where the butter and flour are allowed to brown, it is called a *brown roux*, and is thinned with the soup or stew which it is designed to thicken. Capers added to a *white roux*—which is the butter and flour, with water added—give *caper sauce* for use with boiled mutton. Pickled nasturtiums are a good substitute for capers. Two hard-boiled eggs, cut fine, give egg sauce. Chopped parsley or pickle, and the variety of catsups and sauces, make an endless variety; the *white roux* being the basis for all of them.

Bread Sauce.—For this sauce boil one pint of milk, with one onion cut in pieces. When it has boiled five minutes, take out the onion, and thicken the milk with half a pint of sifted bread-crumbs. Melt a teaspoonful of butter in a frying-pan; put in half a pint of coarser crumbs, stirring them till a light brown. Flavor the sauce with half a teaspoonful of salt, a saltspoonful of pepper, and a grate of nutmeg; and serve with game, helping a spoonful of the sauce and one of the browned crumbs. The boiled onion may be minced fine and added, and the browned crumbs omitted.

Celery Sauce.—Wash and boil a small head of celery, which has been cut up fine, in one pint of water, with half a teaspoonful of salt. Boil till tender, which will require about half an hour. Make a *cream roux*, using half a pint of milk, and adding a quarter of a saltspoonful of white pepper. Stir into the celery; boil a moment, and serve. A teaspoonful of celery salt can be used, if celery is out of season, adding to it the full rule for *cream roux*. Cauliflower may be used in the same way as celery, cutting it very fine, and adding a large cupful to the sauce. Use either with boiled meats.

MINT SAUCE.—Look over and strip off the leaves and cut them as fine as possible with a sharp knife. Use none of the stalk but the tender tips. To a cupful of chopped mint allow an equal quantity of sugar, and half a cup of good vinegar. It should stand an hour before using.

CRANBERRY SAUCE.—Wash one quart of cranberries in warm water, and pick them over carefully. Put them in a porcelain-lined kettle, with one pint of cold water and one pint of sugar, and cook without stirring for half an hour, turning then into molds. This is the simplest method. They can be strained through a sieve, and put in bowls, forming a marmalade, which can be cut in slices when cold; or the berries can be crushed with a spoon while boiling, but left unstrained.

EGG SAUCE.—Cut up three hard boiled eggs in small dice, salt, pepper, minced onions (one teaspoonful), parsley and thyme; add all these to the drawn butter recipe. It is very nice for boiled chickens, fish or leg of mutton.

OYSTER SAUCE.—Scald one pint of large fresh oysters just enough to plump them, adding a tablespoonful of pepper, vinegar, a little black pepper and salt; pour this into a recipe of well made drawn butter (as above) at boiling point; stir thoroughly, and serve.

TOMATO SAUCE.—Scald and peel six large, ripe tomatoes; cut them up and stew slowly; cream together one tablespoonful of butter, one tablespoonful of sugar, one tablespoonful of flour; when the tomatoes are thoroughly done and reduced to a fine pulp, add pepper and salt; stir the butter, sugar and flour in; let boil up, and serve. In winter this sauce may be made from nice canned tomatoes.

PEPPER VINEGAR.—Fill a quart bottle or jar with small peppers, either green or ripe; put in two tablespoonfuls of sugar and fill with good cider vinegar. Invaluable in seasoning sauces, and good to eat with fish or meat.

CHILI SAUCE.—Twelve ripe tomatoes, four ripe peppers, two onions, two tablespoonfuls of salt, two of sugar, three teacups of vinegar, a little cinnamon, chopped tomatoes, peppers and onions, very fine; boil one hour.

WHITE SAUCE FOR FOWLS.—Take the neck, gizzard and liver of fowls, with a piece of veal or calf's foot; boil in one quart of water with a few whole peppers, and salt, till reduced to one pint; then thicken with two tablespoonfuls of flour mixed with two tablespoonfuls of butter; boil five or six minutes; have ready the yolks of two eggs beaten with one teacup of cream from the morning's milk; pour into the saucepan and shake a moment until done.

MUSHROOM SAUCE.—Wash and pick one pint of fresh mushrooms (or one can of French mushrooms), put in a saucepan with a little salt, nutmeg (three grates), one blade of mace, one pint of very sweet cream, a lump of butter (size of a pullet's egg) rubbed in one teaspoonful of flour; boil up, stir until cooked, and serve with chickens.

HORSE-RADISH SAUCE.—One teacupful of grated horseradish, one tablespoonful of ground mustard, one tablespoonful of sugar, four tablespoonfuls of vinegar and one of olive oil, pepper and salt.

MINT VINEGAR.—Take a glass can and put loosely into it enough nice, clean mint leaves to fill it; then pour over enough good vinegar to fill the bottle full. Cork tight and let stand for three weeks; then pour off into another bottle and keep to flavor mint sauce, etc.

DUTCH SAUCE.—FOR FISH.—One-half teaspoonful of flour, two ounces of butter, four tablespoonfuls of vinegar—tarragon vinegar is best—yolks of two eggs, juice of half a lemon, salt to the taste. Put all the ingredients except the lemon juice into a stewpan. Set it over the fire and stir constantly until it heats (but not boils). Scald the lemon.

Meats.—BEEF.—The best beef is of a clear red color, slightly marbled with fat, and the fat itself of a clear white. Where the beef is dark red or bluish, and the fat yellow, it is too old, or too poorly fed, to be good. The sirloin and ribs, especially the sixth, seventh and eighth, make the best roasting pieces. The ribs can be removed and used for stock, and the beef rolled or skewered firmly, making a piece very easily carved, and almost as presentable the second day as the first. For steaks sirloin is nearly as good, and much more economi-

cal, than porter-house, which gives only a small eatable portion, the remainder being only fit for the stock-pot. If the beef be very young and tender, steaks from the round may be used; but these are usually best stewed. Other pieces and modes of cooking are given under their respective heads.

MUTTON.—Mutton should be a light, clear red, and the fat very white and firm. It is always improved by keeping, and in cold weather can be hung for a month, if carefully watched to see that it has not become tainted. Treated in this way, well-fed mutton is equal to venison. If the fat is deep yellow, and the lean dark red, the animal is too old; and no keeping will make it really good eating. Four years is considered the best age for prime mutton.

PORK.—Pork should have fine, white fat, and the meat should be white and smooth. Only country-fed pork should ever be eaten, the pig even then being liable to diseases unknown to other animals, and the meat, even when carefully fed, being at all times less digestible than any sort. Bacon, carefully cured and smoked, is considered its most wholesome form.

Poultry.—Poultry come last. The best turkeys have black legs; and, if young, the toes and bills are soft and pliable. The combs of fowls should be bright colored, and the legs smooth.

Geese, if young and fine, are plump in the breast, have white, soft fat, and yellow feet.

Ducks are chosen by the same rule as geese, and are firm and thick on the breast.

Pigeons should be fresh, the breast plump, and the feet elastic. Only experience can make one familiar with other signs; and a good butcher can usually be trusted to tide one over the season of experience, though the sooner it ends the better for all parties concerned.

Boiled Meats and Stews.—All meats intended to be boiled and served whole at table must be put into boiling water, thus following an entirely opposite rule from those intended for soups. In the latter, the object being to extract all the juice,

cold water must be used first, and then heated with the meat in it, and half an hour to the pound allowed. In the former, all the juice is to be kept in; and by putting into boiling water, the albumen of the meat hardens on the surface and makes a case or coating for the meat, which accomplishes this end. Where something between a soup and a plain boiled meat is desired, as in *beef bouilli*, the meat is put on in cold water, which is brought to a boil very quickly, thus securing good gravy, yet not robbing the meat of all its juices. With corned or salted meats, tongue, etc., cold water must be used. If to be eaten cold, such meats should always be allowed to cool in the water in which they were boiled; and this water, if not too salt, can be used for dried bean or pea soup.

Boiled Meats.—In boiling meat, simply for the meat's sake, or the use of it, you follow an opposite rule, in the beginning, from that in regard to boiling meat for soup. You put it into boiling, instead of cold, water.

Cold water draws the juice of meat, which is precisely what you want in broth and soup. Boiling water contracts and coagulates the surface, and keeps in the juice; which again is precisely what you want.

Certain preparations of meats, however, which are, in character, between a soup and a boiled dish, as will appear in detail, are covered at first with cold water, and then brought to a quick boil. This method steers between the two results, and secures at once a good gravy and an eatable, nourishing piece of meat. Corn and salted meats are put on to boil in cold water.

Beef Bouilli.—This is one of the dishes, just now referred to, which comes between a soup and a simple boiled meat. It is, in fact, merely a whole stew.

Take a nice round of fresh meat. Trim off almost all the fat—all the gristle and hard, outside, scrappy bits—and take out the bone. Wash it, and lay it in a deep stew-pan, or soup-pot; cover it once and a half with cold water, and set it on the fire where it will come quickly to a boil. Take off the scum carefully, as it rises. Cut up in small bits and slices two carrots, two small turnips, or one large one, two onions, and a large head, or two small ones, of celery. If you have

no celery, you can do without it by adding celery seed or celery salt to the spicing. When the scum is well removed, put in some vegetables and set the pot where it will only boil, or simmer, very gently, yet steadily, like soup. Scatter in a dozen whole cloves. Keep closely covered. Allow four hours; cook it till quite tender. One hour before it is done, put in a teaspoonful of made mustard, a large spoonful of any fine catsup or sauce, and a gill or more of wine if you choose. Still keep closely covered. When the beef is done, take it carefully on a deep dish, hot, and set it near the fire until you finish your gravy. Do this by stirring in a little smooth flour thickening. Prepare two teaspoonfuls of flour to a quart, mixed with a little cold water, and added gradually, till you are sure you want it all. The vegetables will already have partly thickened the soup. Boil up and turn over the meat.

Scatter some bits of nice mixed pickles—cauliflower, sliced gherkin, with bits of some red pickle for the color—over the meat, before it goes to table.

Corned Beef.—Salted and corned meats are put to boil in cold water.

Buy corned beef from the round of a large, well-fed creature. Put to soak over night in cold water. Early in the morning wash and wipe, and put into the pot to boil. Cover twice deep with cold water, and set where it will heat up gradually and come to a very gentle boil. Take the scum off as it comes up. Boil four hours—a large solid piece may take from four to five—and be sure that it is tender when you take it off. If it is to be served hot for dinner, cook it in time to allow of removing it from the flour and letting it stand in the liquor it was boiled in until cooled down from the boil as far as will still be palatable. This makes it richer and more tender. Make a smooth drawn butter sauce to eat with it.

If it is to be eaten cold, take it from the fire and from the pot as soon as done. With a knife and fork, chiefly with the fork, divide and shred it into small pieces; mix these, fat and lean—disregarding all undesirable bits—equally together; pack all down into a pan; set a pan, just a little smaller, inside, upon the meat, so as to press it down, and put a heavy weight

—flatirons answer the purpose very well—into the upper pan, and set all away for some hours, or over night. It will cut in delicious, tender, marbled slices, and is excellent for a Sunday lunch with hot vegetables.

Boiled Tongue.—Smoked tongue is best.

Wash, and lay in cold water over night. Put on to boil in cold water, and boil, not furiously, but steadily, for four hours. Take out, peel off the skin, and put back into the hot liquor, and set away to grow cold. It may remain in the water through the rest of the day and over night, if not wanted sooner. Cut tongue in lengthwise slices, beginning at the outside of the bend. This makes a wonderful difference in tenderness and flavor.

Boiled Veal.—Take out the bone from a fillet of veal. Make a stuffing, as for roast meat. Fill the place of the bone with the stuffing, and draw the ends of the meat as tight as possible with a needle and a coarse, strong thread. Scald and flour a cloth, as for boiled mutton, and sew or tie the meat in it tightly. Boil three hours, or until tender, trying with a knitting-needle. Make an oyster sauce, by soup recipe, to serve with it. Well cooked, it is much like boiled turkey similarly served.

Boiled Mutton.—A shoulder of mutton will boil in an hour, or a little more. A leg will take from an hour and a half to two hours, according to size. Try with a knitting-needle, to ascertain when it is tender. Have a cloth to boil it in. Wring this out of scalding water, dredge it thickly with flour, and tie up the meat tightly in it. Put it into a large kettle of boiling water, and throw in two heaping tablespoonfuls of salt. When done, put it, rag and all, into a pan, and turn cold water over it enough to cover. Let it stand a few minutes, but not long enough to cool too much. Then take off the cloth, and send at once to table. Serve with it a smooth butter sauce, with capers separately.

Boiled Lamb.—Same way, allowing about a fourth less time. It must depend upon the size, however. Eight minutes to the pound, then try it.

To Choose Beef.—When beef is good it may be known by

its texture and color; the lean will have a fine, open grain of a deep coral or bright carnation red; the fat rather inclining to white than yellow; and the suet firm and white. Very yellow fat is generally sufficient proof of inferior beef.

The better roasting pieces of beef are the prime ribs, sirloin, and what is known as the porter-house piece; it may be recognized by the bone.

The best steaks are cut from the sirloin and porter-house. The last mentioned cut probably took its name from having been the most highly esteemed steak, and so dished for the palate of the epicure at porter-houses, which were formerly the only eating-houses. Fine steaks may be cut from between the ribs.

The round of tender, fat beef, cuts very good steaks, as does also the cross-ribs, but they are juiceless compared with the other pieces. The lean of fat beef is the most juicy and tender.

The neck, shin, or marrow bone, leg or head make good soups.

Beef skirts are good for sausage meat, stewing, hashes, or for mince-pie meat; or they may be broiled or fried.

To Fry Tripe.—Take prepared tripe, lay it in a little water over night; in the morning scrape the rough side clean, then wipe it dry; then dip in wheat flour or rolled crackers. Have a thick-bottomed frying pan, put into it a cup of lard or beef dripping; let it become boiling hot; then lay the tripe in, the rough side down first, let it fry gently; when this side is a delicate brown turn the other and do likewise; then take it from the pan, add to it the fat in which it was fried a wineglass of vinegar, let it boil up once, then pour it in the dish with the tripe; or you may use water instead of vinegar.

Beef Liver.—Cut the liver in thin slices; dip each slice in wheat flour or rolled crackers, and fry in hot lard or beef dripping; season with pepper and salt. It must be thoroughly cooked and a fine brown.

To Stew a Round of Beef.—Boil the beef till it is rather more than half done; gash it with a sharp knife, then rub it over with salt and pepper and sweet herbs chopped

small; one sliced carrot, also a leek or onion sliced small; dredge it white with flour; strew bits of butter over it, and put it into a dinner pot with a pint or more of the water in which it was boiled; cover it close, and let it bake or stew slowly for two hours; add a little hot water when it may be necessary to keep it from burning; turn it once; when it is nicely browned take it up, add a little boiling water to the gravy, stir it well together, let it boil up once, then pour it over the meat.

Beef Heart Baked or Roasted.—Cut a beef heart in two; take out the strings from the inside; wash it with warm water; rub the inside with pepper and salt, and fill it with a stuffing of bread and butter moistened with water, and seasoned with pepper and salt, and, if liked, a sprig of thyme made fine; put it together and tie a string round it; rub the outside with pepper and salt; stick bits of butter on, then dredge flour over and set it on a trivet or muffin rings, in a dripping pan; put a pint of water in to baste with, then roast it before a hot fire or in a hot oven; turn it round and baste frequently. One hour will roast or bake it; when done take it up, cut a lemon in thin slices, and put it in a pan with a bit of butter; dredge in a teaspoonful of flour; let it brown, add a small teacupful of boiling water; stir it smooth, and serve in a gravy tureen.

Beef Kidneys.—These may be split and fried, or broiled, or they may be chopped small and made a hash or stew. Cut them in half, or mince them, and put them in a stewpan with enough hot water to moisten them; then cover them close and let them simmer gently until tender; add a good bit of butter, pepper and salt to taste, and some browned flour; a wineglass of wine or catsup may be added, if liked. Toast some thin slices of bread delicately brown, take off the crust and lay them in a dish, and put the stew or hash over. A finely chopped onion or leek may be added to it, if liked.

Hashed Beef.—Take some very rare done or uncooked beef, chop it fine, one-fourth as much fat as lean, and moisten it with water or gravy; if with water, add a bit of butter rolled in flour; put it in a closely covered stewpan over a gentle fire for half an hour; then dredge in a little browned flour, add salt and pepper to taste, and cover it for fifteen minutes, and

serve. Or, cut some thin slices of toast in neat squares, put them in the dish and put the hash on it; or serve it on boiled rice. Some persons like a teaspoonful of made mustard or catsup put to it before dishing it.

Beef Steaks.—Sirloin, and what is known in New York markets as porter-house steaks, are the choicest cuts. If the beef is not very tender and young, it may be improved by beating gently with a rolling-pin or potato-beetle before cooking; the steaks should be nearly the thickness of an inch; beef steaks must on no account be washed. By keeping beef as long as possible without tainting, it may be improved in flavor, and will become more tender; broiling is by far the best manner of cooking beef steaks.

Fried Beef Steaks.—Cut some of the fat from the steak and put it into a frying-pan and set it over the fire; if the steaks are not very tender, beat them with a rolling-pin, and when the fat is boiling hot, put the steak evenly in, cover the pan and let it fry briskly until one side is done; sprinkle a little pepper and salt over, and turn the other; let it be rare or well-done, as may be liked; take the steak on a hot dish, add a wine-glass or less of boiling water or catsup to the gravy; let it boil up once and pour it in the dish with the steak.

Beef and Onion Stew.—Cut two pounds of meat in pieces the size of an egg, and put it into a stewpan with enough warm water nearly to cover it; cover the stewpan and let it simmer slowly for half an hour; then skim it clear, peel five or six small onions and cut them in thick slices; pare half a dozen large potatoes and cut them in half, or quarters; add a tablespoonful of salt, and a small teaspoonful of pepper to the stewed meat; then put in the potatoes and onions. If the meat is lean, (it is best to have a small portion of fat,) add a bit of butter the size of a large egg; shake over it a tablespoonful of wheat flour, or work it into the butter; cover the stewpan close, and let it stew gently that it may brown without burning; one hour is required for making this stew. If the potatoes are cut smaller than halves, they should be put in twenty minutes before it is done; half an hour will be required to cook them if cut in two.

To Roast Beef.—Have a bright, clear fire before putting down the roast; if it is large, have a fire according; let it be a clear, steady fire, with a bed of coals at the bottom—this is for a wood fire; for a coal fire, make one large enough to last the length of time required for the roast (fifteen minutes for each pound of meat); make the front of the fire clear from ashes, and brush up the hearth; rinse the meat in cold water, wipe it dry; mix salt and pepper, a teaspoonful of salt, and a saltspoonful of pepper for each pound of meat; rub it over every part, then put it evenly on the spit, taking care not to run it through the best parts; or if it is done in a reflector, set it on a trivet or muffin rings, and turn the pan about as occasion may require; then put it down at a little distance from the fire, that the outside may not be too much done before the inside is cooked; put at least a pint of water into the dripping-pan, with which to baste; replenish with boiling water, so that there shall not be less than a pint of gravy when the meat is done, for a piece weighing five or six pounds; when about half done, clear the front of the fire and set it a little nearer; turn the meat so that all sides may be done evenly; fifteen minutes before it is done, if you please, dredge with the fat of the meat wheat flour until it looks white; baste it freely and set it to finish; when done, take it on to a large dish and cover with a tin cover; set the dripping over the fire, dredge in a small tablespoonful of flour, stir it smooth; when it is a fine brown, add a teacupful of boiling water, let it boil up, stirring it meanwhile; then pour it through a gravy strainer into a tureen; if there is much fat skim nearly all of it off; or, instead of dredging in flour, make a thin, smooth batter of a tablespoonful of flour, and a small cup of cold water; let the gravy in the pan become boiling hot before stirring it in; then stir it smooth, and when it is a fine rich brown, strain it into the tureen and serve with the meat.

The vegetables most proper with roast beef are plain boiled or mashed potatoes, with boiled spinach, beets or dressed celery, and turnips mashed, or squash. If you please, pickles, or grated horseradish, may also be served with roast beef instead of spinach or celery, with made mustard and catsup in the castor. In roasting meat it should be so placed as to bring the largest or thickest part nearest the fire. In roasting meat its

juiciness depends on the frequency of basting it, after it has fairly begun to roast.

VEAL.—Veal should not be kept long before dressing, as it by no means improves by keeping. The loin is apt to taint under the kidney. When soft and slimy it is stale; it will be cool and firm and have an agreeable smell when fresh.

In the shoulder, if the vein is a clear red, it is good. When there are any yellow or dark spots it is stale. The breast and neck, when good, look white and clear. Veal must always be well cooked. The leg of veal is generally boiled or made soup of. The loin also may be boiled, but it is best roasted, and cut into chops and broiled and fried. The shoulder may be roasted; it may be boned and stuffed and then roasted, or it may be split, after having been boned, and fried or broiled. The breast may be roasted, stewed, or broiled, or made a pie. Steaks are cut from leg or shoulder. The neck, or scrag, may be cut in chops and fried, broiled, or stewed; or a dish of soup may be made of it.

Calf's liver is cut in steaks, and fried like beef liver, or it may be broiled and buttered.

Veal sweet-breads are roasted with the breast, or they may be fried or stewed.

Calf's head may be boiled and served with a sauce, and a soup made of the liquor in which it is boiled.

The head and feet are used for making jellies.

TO BROIL VEAL.—Put in hot water (not boiling) to cover it, put to it a teaspoonful of salt, cover the pot, and let it boil very gently, taking off the scum as it rises; allow fifteen minutes for each pound of meat; four pounds of meat will require one hour gentle boiling. Serve boiled veal with drawn butter, or oysters, or lemon, or parsley sauce, and plain boiled potatoes with pickles, or lettuce, or celery. Boil the loin and serve with egg sauce.

CALF'S HEAD.—Clean it very nicely and soak it in salt and water, that it may look white (clean as directed for beef tripe), take out the eyes, take out the tongue to salt, and the brains to make a little dish; boil the head very tender, and serve with a sauce, or take it up, put bits of butter all over it, dredge with

flour, and season with pepper and finely sifted sweet herbs, if liked, set it in a hot oven or before the fire; baste with some of the water in which it was boiled, or squeeze the juice of a lemon over; roast it a fine brown; then take it on a hot dish and put on a tin cover; add a piece of butter, the size of an egg, to the gravy; cut a small lemon in thin slices, and make the gravy boiling hot; add them to it; let them fry brown, then put a teaspoonful of browned flour, and a teacup of boiling water to the gravy, and serve with the meat. The lemon may be dispensed with if preferred—it will generally be liked.

To Make a Dish of Calf's Brains.—Wash them in salt and water, then boil them tender, and take them in a dish; put butter and pepper over, and serve. Or, after washing the brains in salt and water, wipe them dry, and dip them in wheat flour, or in beaten egg, and then into bread crumbs, and fry in hot lard or beef dripping; season with pepper and salt, and slices of lemon fried, if liked.

Calf's Head Cheese.—Boil a calf's head in water enough to cover it, until the meat leaves the bones, then take it with a skimmer into a wooden bowl or tray; take from it every particle of bone; chop it small; season with pepper and salt, a heaping teaspoonful of salt, and a teaspoonful of pepper will be sufficient; if liked, add a teaspoonful of finely chopped sweet herbs; lay a cloth in a cullender, put the minced meat in it, then fold the cloth closely over it, lay a plate over, and on it a gentle weight. When cold it may be sliced for supper or sandwiches. Spread each slice with made mustard.

Calf's Head (a fine dish).—Boil a calf's head (after having cleaned it), until tender, then split it in two, and keep the best half (bone in it if you like); cut the meat from the other in uniform pieces, the size of an oyster; put bits of butter the size of a nutmeg all over the best half of the head; sprinkle pepper over, and dredge on flour until it looks white, then set it on a trivet or muffin rings in a dripping pan; put a cup of water into the pan and set it in a hot oven or before a hot fire; turn it that it may brown evenly; baste once or twice. Whilst this is doing, dip the prepared pieces of the head in wheat flour or batter, and fry in hot lard or beef dripping, a

delicate brown; season with pepper and salt, and slices of lemon, if liked. When the roast is done put it in a hot dish, lay the fried pieces around it and cover with a tin cover; put the gravy from the dripping pan into the pan in which the pieces were fried, with the slices of lemon, and a teaspoonful of browned flour, and, if necessary, a little hot water. Let it boil up once, and strain it into a gravy boat and serve with the meat.

VEAL CHOPS.—Cut your chops about an inch thick; beat them flat with a rolling pin, put them in a pan, pour boiling water over them, and set them over the fire for five minutes; then take them up and wipe them dry; mix a tablespoonful of salt and a teaspoonful of pepper for each pound of meat; rub each chop over with this, then dip them, first into beaten egg, then into rolled crackers as much as they will take up; then finish by frying in hot lard or beef dripping; or broil them. For the broil have some sweet butter on a steak dish; broil the chops until well done, over a bright, clear fire of coals (let them do gently that they may be well done) then take them on to the butter, turn them carefully over once or twice in it, and serve. Or, dip the chops into a batter, made of one egg beaten with half a teacup of milk, and as much wheat flour as may be necessary. Or, simply dip the chops without parboiling into wheat flour; make some lard or beef fat hot in a frying pan; lay the chops in, and when one side is a fine, delicate brown, turn the other. When all are done, take them up, put a very little hot water into the pan, then put it into the dish with the chops.

Or, make a flour gravy thus: After frying them as last directed, add a tablespoonful more of fat to that in the pan, let it become boiling hot; make a thin batter, of a small tablespoonful of wheat flour and cold water; add a little more salt and pepper to the gravy, then gradually stir in the batter; stir it until it is cooked and a nice brown; then put it over the meat, or in a dish with it; if it is thicker than is liked, add a little boiling water.

VEAL STEWED WITH VEGETABLES (*Ragout*).—Wash three pounds of veal in cold water, then cut it small and put it in a stewpan with water nearly to cover it; add a tablespoonful of

salt and a teaspoonful of pepper; cover the stewpan, and let it simmer for twenty minutes, then skim it clear. Whilst the meat is stewing, scrape one large or two small carrots and cut them in thin slices, a quarter of an inch thick, notch the edges, and put them in a stewpan, with boiling water to cover them, and set it over the fire until they are tender; dip a bunch of parsley into boiling water and mince it fine; cut a leek into thin slices; pare and cut six small potatoes in halves or quarters, then take the carrot from the water with a skimmer; put quarter of a pound of sweet butter to the meat; dredge over it a tablespoonful of browned flour, and add the vegetables; cover the stewpan and let it stew gently for an hour; then take the meat on a dish, put the vegetables around it, pour the gravy over, and serve.

To Roast Veal.—Rinse the meat in cold water; if any part is bloody, wash it off; make a mixture of pepper and salt, allowing a large teaspoonful of salt and saltspoonful of pepper for each pound of meat; wipe the meat dry; then rub the seasoning into every part, shape it neatly and fasten it with skewers, and put it on a spit, or set it on a trivet or muffin rings, in a pan; stick bits of butter over the whole upper surface; dredge a little flour over, put a pint of water into the pan to baste with, and roast it before the fire in a Dutch oven or reflector, or put it into a hot oven; baste it occasionally, turn it if necessary that every part may be done; if the water wastes, add more, that the gravy may not burn; allow fifteen minutes for each pound of meat; a piece weighing four or five pounds will then require one hour or an hour and a quarter. When it is nicely browned and done, take it up; add a bit of butter the size of a large egg to the gravy, dredge in a tablespoonful of flour, stir it smooth, let it brown, add a cup of boiling water to it; then strain it into a gravy-boat, and serve with the meat; serve plain boiled or mashed potatoes with the meat, with such green vegetables as may be liked.

Plain boiled or mashed potatoes, with any other vegetable which may be liked may be served with roast veal; also pickles of any kind.

Veal Hashed.—Cut a pound of cold veal small, season it to taste with pepper and salt, dredge a small teaspoonful of wheat flour over it, add a bit of butter the size of an egg, put

it in a stewpan, put water enough to make it moist; then cover it close and set it over a gentle fire for half an hour; stir it occasionally; if liked, a bunch of parsley may be cut small and added to it; when half done, toast some thin slices of bread delicately brown, cut it in small squares or diamonds, and serve the hash on it, for breakfast. A glass of wine may be added.

Veal Pie.—Cut a breast of veal small and put it in a stewpan, with hot water to cover it; add to it a tablespoonful of salt and set it over the fire; take off the scum as it rises; when the meat is tender, turn it into a dish to cool; take out all the small bones, butter a tin or earthen basin or pudding-pan, line it with a pie paste (see clam pie), lay some of the parboiled meat in to half fill it, put bits of butter the size of a hickory nut all over the meat, shake pepper over, dredge wheat flour over until it looks white; then fill it nearly to the top with some of the water in which the meat was boiled, roll a cover for the top of the crust, puff paste it, giving it two or three turns, and roll it to nearly half an inch thickness; cut a slit in the centre and make several small incisions on either side of it; lay some skewers across the pie, put the crust on, trim the edges neatly with a knife, bake one hour in a quick oven. A breast of veal will make two quart basin pies; half a pound of nice corned pork, cut in thin slices and parboiled with the meat, will make it very nice, and little, if any, butter will be required for the pie; when pork is used no other salt will be necessary.

Potato and Veal Pie.—Peel and cut small some cold boiled potatoes; cut some cold veal small; put some of the meat in the bottom of a baking dish, or tin basin, put on a layer of potatoes, sprinkle pepper and salt over and bits of butter; then another layer of meat and potatoes and seasoning, and so continue until the pan is nearly full, then add to it water or gravy to moisten it; cover it with a pie crust, and bake in a quick oven for three-quarters of an hour.

To Boil Pickled Beef.—Put on the fire in cold water; let it simmer slowly, allowing fifteen minutes to every pound; do not let it boil; keep skimming or it will look dirty; if it is left in the pot until the water is cold it will be much more tender.

Spiced Beef.—Take a piece of beef from the fore-quarter,

weighing ten pounds. Those who like fat should select a fatty piece; those who prefer lean may take the shoulder clod, or upper part of the fore-leg. Take one pint of salt, one teacup of molasses or brown sugar, one tablespoonful of ground cloves, allspice and pepper, and two tablespoonfuls of pulverized saltpetre. Place the beef in a deep pan; rub with this mixture; turn and rub each side twice a day for a week; then wash off the spices; put in a pot of boiling water, and, as often as it boils hard, turn in a teacupful of cold water. It must simmer for five hours, on the back part of the stove. Press under a heavy weight until it is cold, and you will never desire to try corned-beef of the butcher again. Your pickle will do for another ten pounds of beef, first rubbing into it a handful of salt. It can be renewed and a piece kept in preparation every day. This is good to pickle tongues also.

Beef.—To pickle for drying or boiling, thoroughly rub salt into it, and let it remain twenty-four hours to draw off the blood; after which drain and pack as desired; have ready a pickle prepared as follows: For every one hundred pounds of beef, seven pounds of salt, one ounce of saltpetre, one quart of molasses, eight gallons of soft water; boil and skim well; when cold pour it over the beef. Pieces designed for drying should be taken out in two weeks, and soaked over night, to take the salt from the outside.

Remains of Roast Beef.—Take off with a sharp knife all the meat from the bones, chop it fine, take cold gravy without the fat, put it in the spider to heat; if you have not this, some of the water in which the bones were boiled; when it boils up, sprinkle in salt and put in the minced meat; cover it and let it stand upon the fire long enough to heat it thoroughly, then stir in a small piece of butter, toast bread, and lay in a dish; put the meat over it; serve hot.

Boiling Meat.—There is all the difference in the world between boiling meat which is to be eaten, and meat whose juices are to be extracted in the form of soup. If the meat is required as nourishment, of course you want the juices kept in. To do this, it is necessary to plunge it into boiling water, which will cause the albumen in the meat to coagulate suddenly,

and act as a plug or stopper to all the tubes of the meat, so that the nourishment will be tightly kept in. The temperature of the water should be kept at boiling point for five minutes, and then as much cold water must be added as will reduce the temperature to one hundred and sixty-five degrees. Now if the hot water, in which the meat is being cooked, is kept at this temperature for some hours, we have all the conditions united, which give to the flesh the quality best adapted for its use as food. The juices are kept in the meat, and, instead of being called upon to consume an insipid mass of indigestible fibres, we have a tender piece of meat, from which, when cut, the imprisoned juice runs freely. If the meat be allowed to remain in the boiling water, without the addition of any cold water to it, it becomes in a short time altogether cooked, but it will also be almost indigestible, and therefore unpalatable.

To Bake a Ham.—Most persons boil a ham, but a first-rate Virginia housewife tells us it is much better if baked properly. Soak it for an hour or more and wipe dry. Next spread it all over with a batter made of flour and water; put it into a deep pan with muffin rings or bits of oak wood under it to keep it out of the gravy. When fully done—it will take from five to seven hours—take off the skin and batter crusted upon the flesh side and set it away to cool, or glaze it by the following recipe:

Glazed Ham.—Beat the yolks of two eggs very light. Spread them all over your ham; then sift over fine cracker crumbs, and set in the oven to brown. Currant jelly may be used instead of yolks of eggs, and is very nice.

Poultry and Game.—To Clean Poultry.—First be very careful to singe off all down by holding over a blazing paper, or a little alcohol burning in a saucer. Cut off the feet and the ends of the wings, and the neck as far as it is dark. If the fowl is killed at home, be sure that the head is chopped off, and never allow the neck to be wrung, as is often done. It is not only an unmerciful way of killing, but the blood has thus no escape, and settles about all the vital organs. The head should be cut off, and the body hang and bleed thoroughly before using.

Pick out all the pin-feathers with the blade of a small knife.

Turn back the skin of the neck, loosening it with the finger and thumb, and draw out the windpipe and crop, which can be done without making any cut. Now cut a slit in the lower part of the fowl, the best place being close to the thigh. By working the fingers in slowly, keeping them close to the body, the whole intestines can be removed in a mass. Be especially careful not to break the gall-bag, which is near the upper part of the breastbone, and attached to the liver. If this operation is carefully performed, it will be by no means so disagreeable as it seems. A French cook simply wipes out the inside, considering that much flavor is lost by washing. We prefer to wash in one water, and dry quickly, though in the case of an old fowl, which often has a strong smell, it is better to dissolve a teaspoonful of soda in the first water, which should be warm, and wash again in cold, then wiping dry as possible. Slit and wash the gizzard, reserving it for gravy.

Dressing for Poultry.—One pint of bread or cracker crumbs, into which mix dry one teaspoonful of pepper, one of thyme or summer savory, one even tablespoonful of salt, and, if in season, a little chopped parsley. Melt a piece of butter the size of an egg in one cup of boiling water, and mix with the crumbs, adding one or two well-beaten eggs. A slice of salt pork chopped fine is often substituted for the butter.

For ducks two onions are chopped fine, and added to the above; or a potato dressing is made, as for geese, using six large boiled potatoes, mashed hot, and seasoned with an even tablespoonful of salt, a teaspoonful each of sage and pepper, and two chopped onions.

Game is usually roasted unstuffed, but grouse and prairie-chickens may have the same dressing as chickens and turkeys, this being used also for boiled fowls.

Roast Turkey.—Prepare by cleaning, as in general directions above, and, when dry, rub the inside with a teaspoonful of salt. Put the gizzard, heart, and liver on the fire in a small saucepan, with one quart of boiling water and one teaspoonful of salt, and boil two hours. Put a little stuffing in the breast, and fold back the skin of the neck, holding it with a stitch or with a small skewer. Put the remainder in the body, and sew it up with darning cotton. Cross and tie the legs

down tight, and run a skewer through the wings to fasten them to the body. Lay it in the roasting-pan, and for an eight-pound turkey allow not less than three hours' time, a ten or twelve pound one needing four. Put a pint of boiling water with one teaspoonful of salt in the pan, and add to it as it dries away. Melt a heaping tablespoonful of butter in the water and baste very often. The secret of a handsomely-browned turkey lies in this frequent basting. Dredge over the flour two or three times, as in general roasting directions, and turn the turkey so that all sides will be reached. When done, take up on a hot platter. Put the baking-pan on the stove, having before this chopped the gizzard and heart fine, and mashed the liver, and put them in the gravy-tureen. Stir a tablespoonful of brown flour into the gravy in the pan, scraping up all the brown, and add slowly the water in which the giblets were boiled, which should be about a pint. Strain on to the chopped giblets, and taste to see if salt enough. The gravy for all roast poultry is made in this way. Serve with cranberry sauce or jelly.

Roast or Boiled Chickens.—Stuff and truss as with turkeys, and to a pair of chickens weighing two and a half pounds each, allow one hour to roast, basting often, and making a gravy as in precedent recipe. Boil as in rule for turkeys.

Roast Duck.—After cleaning, stuff as in rule given for poultry dressing, and roast—if game, half an hour; if tame, one hour, making gravy as in directions given, and serving with currant jelly.

Birds.—Small birds may simply be washed and wiped dry, tied firmly, and roasted twenty minutes, dredging with flour, basting with butter and water, and adding a little currant jelly or wine to the gravy. They may be served on toast.

Boiled Turkey.—Clean, stuff, and truss the fowl selected, as for a roasted turkey. The body is sometimes filled with oysters. To truss in the tightest and most compact way, run a skewer under the leg-joint, between the leg and the thigh, then run through the body and under the opposite leg-joint in the same way; push the thighs up firmly close to the sides; wind a string about the ends of the skewer, and tie it tight. Treat the wings in the same way, though in boiled fowls the

points are sometimes drawn under the back, and tied there. The turkey may be boiled with or without cloth around it. In either case use boiling water, salted as for stock, and allow twenty minutes to the pound. It is usually served with oyster sauce, but parsley or capers may be used instead.

Boned Turkey.—This is a delicate dish, and is usually regarded as an impossibility for any ordinary house-keeper; and, unless one is getting up a supper or other entertainment, it is hardly worth while to undertake it. If the legs and wings are left on, the boning becomes more difficult. The best plan is to cut off both them and the neck, boiling all with the turkey, and using the meat for croquettes or hash.

Draw only the crop and windpipe, as the turkey is more easily handled before dressing. Choose a fat hen turkey of some six or seven pounds weight, and cut off legs up to second joint, with half the wings and the neck. Now, with a very sharp knife, make a clean cut down the entire back, and, holding the knife close to the body, cut away the flesh, first on one side, and then another, making a clean cut around the pope's nose. Be careful, in cutting down the breastbone, not to break through the skin. The entire meat will now be free from the bones, save the pieces remaining in legs and wings. Cut out these, and remove all sinews. Spread the turkey skin-side down on the board. Cut out the breasts, and cut them up in long, narrow pieces, or as you like. Chop fine a pound and a half of veal or fresh pork, and a slice of ham also. Season with one teaspoonful of salt; a saltspoonful each of mace and pepper; half a saltspoonful of cayenne and the juice of a lemon. Cut half a pound of cold boiled smoked tongue into dice. Make layers of this force-meat, putting half of it on the turkey and then the dice of tongue, with strips of the breast between, using force-meat for the last layer. Roll up the turkey in a tight roll, and sew the skin together. Now roll it firmly in a napkin, tying at the ends and across in two places to preserve the shape. Cover it with boiling water, salted as for stock, putting in all the bones and giblets, and two onions stuck with two cloves each. Boil four hours. Let it cool in the liquor. Take up in a pan, lay a tin sheet on it, and press with a heavy weight. Strain the water in which it

was boiled, and put in a cold place. Next day take off the napkin and set the turkey in the oven a moment to melt off any fat. It can be sliced and eaten in this way, but makes a handsomer dish served as follows:

Remove the fat from the stock, and heat three pints of it to boiling-point, adding two-thirds of a package of gelatine which has been soaked in a little cold water. Strain a cupful of this into some pretty mold—an ear of corn is a good shape—and the remainder in two pans or deep plates, coloring each with caramel—a teaspoonful in one, and two in the other. Lay the turkey on a small platter turned face down in a larger one, and, when the jelly is cold and firm, put the molded form on top of it. Now cut part of the jelly into rounds with a pepper-box top, or a small star-cutter, and arrange around the mold, chopping the rest and piling about the edge, so that the inner platter or stand is completely concealed. The outer row of jelly can have been colored red by cutting up, and boiling in the stock for it, half of a red beet. Sprigs of parsley or delicate celery-tops may be used as garnish, and it is a very elegant-looking as well as savory dish. The legs and wings can be left on and trussed outside, if liked, making it as much as possible in the original shape; but it is no better, and much more trouble.

Jellied Chicken.—Tenderness is no object here, the most ancient dweller in the barnyard answering equally well, and even better than "broilers."

Draw carefully, and, if the fowl is old, wash it in water in which a spoonful of soda has been dissolved, rinsing in cold. Put on in cold water, and season with a tablespoonful of salt and a half teaspoonful of pepper. Boil till the meat slips easily from the bones, reducing the broth to about a quart. Strain, and, when cold, take off the fat. Where any floating particles remain, they can always be removed by laying a piece of soft paper on the broth for a moment. Cut the breast in long strips, and the rest of the meat in small pieces. Boil two or three eggs hard, and, when cold, cut in thin slices. Slice a lemon very thin. Dissolve half a package of gelatine in a little cold water; heat the broth to boiling-point, and add a salt-spoonful of mace, and, if liked, a glass of sherry, though it is

not necessary, pouring it on the gelatine. Choose a pretty mold, and lay in strips of the breast; then a layer of egg slices, putting them close against the mold. Nearly fill with chicken, laid in lightly; then strain on the broth till it is nearly full, and set in a cold place. Dip for an instant in hot water before turning out. It is nice as a supper or lunch dish, and very pretty in effect.

Turkey and Chicken Stuffing.—Three teacups of grated bread crumbs (no crust and not a drop of water), one cup finely chopped suet, two-thirds of a cup of chopped parsley, a tablespoonful of sweet marjoram and summer savory, one-half teaspoonful of pepper, one teaspoonful of salt, one or two eggs, beaten.

To Boil a Chicken or Turkey.—It is not every housewife who knows how best to boil a chicken. Plain, artless boiling is apt to produce a yellowish, slimy looking fowl. Before cooking, the bird should always be well washed in tepid water and lemon juice, and to insure whiteness, delicacy and succulence, should be boiled in a soup of flour and water; after being put in the boiling water should be allowed to simmer slowly. This method is very effectual in preserving all the juices of the fowl, and the result is a more toothsome and nourishing morsel than the luckless bird which has been "galloped to death" in plain boiling.

Escalloped Turkey.—Take the remains of cold turkey, from which remove all the bones and gristle; chop the meat in small pieces. Place in an earthen dish a layer of powdered cracker, moistened with milk; then add a layer of turkey seasoned with pepper and salt, then another layer of powdered cracker, and then one of turkey, and so on until the dish is filled; over that pour the gravy you may have left, or a little hot water and butter. Finish the top with the powdered cracker, moisten with a beaten egg and sweet milk, bake one hour. Cover the dish for the first half hour, that the top may not become too brown.

Prairie Chickens, Partridges and Quail.—Clean nicely, using a little soda in the water in which they are washed; rinse them and drain, and fill with dressing, sewing them up nicely,

and binding down the legs and wings with cord. Put them in a steamer and let them cook ten minutes. Then put them in a pan with a little butter, set them in the oven and baste frequently until of a nice brown. They ought to brown in about thirty-five minutes. Serve them in a platter with sprigs of parsley alternated with currant jelly.

A Nice Way to Cook Pigeons.—Stuff the birds with a rich bread dressing; place compactly in an iron or earthen dish; season with salt, pepper, and butter (or, if you like best, thin slices of salt pork over the top), dredge thickly with flour and nearly cover them with water. Then put over a closely fitting plate or cover, and place the dish in a moderate oven, from two to four, or even five, hours, according to the age of the birds. If the birds are old and tough, this is the best way they can be cooked, and they may be made perfectly tender and much sweeter than by any other process. If the gravy is insufficient, add a little water before dishing.

To Pot Birds.—Prepare them as for roasting. Fill each with a dressing made as follows: Allow for each bird of the size of a pigeon one-half of a hard boiled egg, chopped fine, a tablespoonful of bread crumbs, a teaspoonful of chopped pork; season the bird with pepper and salt; stuff them, lay them in a kettle that has a tight cover. Place over the birds a few slices of pork, add a pint of water, dredge over them a little flour, cover and put them in a hot oven. Let them cook until tender, then add a little cream and butter. If the sauce is too thin, thicken with flour. One pint of water is sufficient for twelve birds.

Quail on Toast.—After the birds are well cleaned, cut them open on the back, salt and pepper them, and dredge them very lightly with flour. Break them down so they will lie flat, and broil them on a gridiron, or place them in a pan with a little butter and a little water in a hot oven, covering them closely for awhile, until about done. Then take them up and place in a spider on top of the stove, and let them fry a nice brown. Have ready slices of baker's bread well toasted and slightly buttered. The toast should be broken down with a carving knife to make the crust tender; on this place your quails. Make a gravy of the drippings in the pan, thickened

very lightly with browned flour, and pour over each quail. The quails should only be allowed to fry just long enough to brown nicely, and not long enough to dry out; five minutes ought to be sufficient.

FRICASSEE CHICKEN.—Cut up, wash and dry a pair of chickens, put into a stewpan a tablespoonful of butter; let it boil; lay the chickens into this and shake them about, turning them and giving each piece a little glazed look; then add water enough to cover the fowls, and let stew slowly from forty minutes to an hour. Just before serving let it come to a keen boil, and stir in a teacupful of milk or sweet cream, in which a heaping tablespoonful of flour has been stirred. Let it cook five minutes and pour into a dish over which some freshly baked powder biscuits have been opened and spread. Season with salt and pepper.

ESCALLOPED CHICKEN.—Cold chicken, chiefly the white meat, one cup of gravy, one tablespoonful of butter, and one egg, well beaten, one cup of fine bread crumbs, pepper and salt. Take from the chicken all gristle and skin, and cut, not chop, into pieces not less than half an inch long. Have ready the gravy, or some rich drawn butter in a saucepan on the fire. Thicken it well, and stir into it the chicken; boil up once, take it off and add the beaten egg; cover the bottom of a buttered dish with bread crumbs, pour in the mixture, and put in another thick layer of crumbs on top, sticking butter all over it. Bake to a delicate brown in a quick oven. Turkey may be used instead of chicken; also veal.

CHICKEN PIE.—Stew until tender two chickens in just enough water to stew them. Make a nice crust, line a deep dish with it; when the chickens are done remove all the bones; put the chickens into the dish in which they are to be baked; thicken the gravy with a little flour and cream; add a can of oysters; season with salt, pepper and butter; cover the pie with a crust, and bake quickly. This is very nice.

RICE AND CHICKEN PIE.—Boil a pint or more of rice; stir in a teaspoonful of butter, a little milk, two eggs and a little salt. Fricassee two chickens; cover the bottom of a long dish with rice, then a layer of chicken, and so on, until it is

full; save out some of the gravy of the fricassee to eat on the rice; cover the whole with the yolk of an egg and brown it. Curry may be put into the chicken if liked. One chicken makes a good sized dish.

CHICKEN JELLY.—Boil the chicken until tender; cut with a knife fine, put it in a dish or mold; season with salt, pepper, a little summer savory and a teaspoonful of vinegar; boil the bones in the broth awhile and pour over. When cold it will turn out.

TO CHOOSE A GOOSE.—Be careful in choosing a goose that it is young; an old goose is very poor fare. If the skin and joints are tender and easily broken with the finger, it is young; a fat goose is best. The feet and bill of a young goose are yellow; in an old one they are red. When fresh killed, the feet are pliable; if stale, they will be dry and stiff. The loose fat from the inside of a goose should be taken out, and the fat from the lower part of the back. Goose grease may be used medically, but not for eating. Some persons use it for making pie crust and for common molasses cake instead of other shortening.

TO ROAST A GOOSE.—Pick it perfectly clean, cut off the legs at the joints, and singe it nicely; cut off the vent, cut a slit from the breast bone to it, or across, below the breast bone; draw out the entrails, take off that leading to the vent; take out all the loose fat; save the heart and liver; cut a slit at the back of the neck, and draw out the crop; cut off a part of the neck, leave enough of the skin to fasten over against the back; wash the inside of the body with cold water, wipe it dry, and rub it well with a mixture of salt and pepper; prepare the stuffing.

Cut a sixpenny loaf of wheat bread in slices; pour hot water over to wet them; then add a teaspoonful of salt and the same of ground pepper, and quarter of a pound of sweet butter, with a tablespoonful of finely powdered sage or thyme, if liked. Fill the body, then sew up the slit, tie the ends of the legs together, or cut a place and put them in the body; pass a skewer through the hips; put the heart and liver between the wings and the body, and fasten close to it with a skewer; spit it; put a pint of water in the pan to baste with; have a bright, steady and clear fire, with a bed of coals at the bottom, and set the goose at a

little distance at first, until it is heated through; put a teaspoonful of salt to the water in the pan, and baste freely with it after it has begun to roast; put one side to the fire first, then the other; after that the back, and lastly the breast, that it may be evenly done; gradually draw it nearer the fire; when nearly done, stir up the fire, put quarter of a pound of butter in the pan and baste with it; dredge a little flour over it; turn it that every part may be browned; allow fifteen minutes for each pound of meat. It must be well done, which will depend on the state and management of the fire.

If the gravy is very fat, take some of it off; put the pan over the fire, let it become hot, then stir into it a thin batter made of a tablespoonful of wheat flour and cold water; stir it until it is brown and smooth; if it is thicker than is liked, add a little boiling water; stir it in and pour it through a gravy-strainer into a tureen.

A goose may be equally well dressed in a hot oven or stove. Prepare it as directed for roasting; set a trivet or muffin rings in a dripping-pan, and place the goose with its back upon the trivet or rings; put a pint of hot water in the pan; put bits of butter the size of a large hickory nut over the body; dredge wheat flour over, and set in a thoroughly heated brick or stove oven; baste it freely and often; when done, take it from the pan; cover it, and set it before the fire to keep hot; put the pan over the fire; take out the rings or trivet; add a bit of butter the size of an egg, and when it is hot stir it into a thin batter made of a tablespoonful of wheat flour and cold water; if too thick, add hot water to thin it; stir it smooth, and pour through a gravy-strainer into a tureen. A lemon sliced thin and fried in the gravy before putting in the batter and served over the goose, or put in the tureen with the gravy, is liked by some persons.

The stuffing may be made of boiled potatoes, chopped or mashed, instead of bread, and moistened with milk. An onion or leek, finely minced, may be added to the gravy, if liked. Half a pound of fat corned pork chopped small may be put with the stuffing instead of butter for ordinary occasions, if preferred.

A young goose may be cut up and made in a pie or potpie.

An old goose may be rendered eatable thus: Empty it and

put it in hot water to cover it, and let it boil until tender, then roast it or make a fricassee.

The vegetables to be served with roast goose are as follows: Plain boiled or mashed potatoes, mashed yellow turnips or winter squash, apples stewed with sugar, or cranberry jam, boiled onions, pickles and dressed celery.

Dessert—Apple, pumpkin, custard or mince pies.

To Choose Ducks.—Ducks must be fat and plump and thick on the breast. If a duck is young, the skin can be easily broken with the finger, and the feet are pliable. Tame ducks are prepared for the table the same as young geese. For roasting, have a hot fire, and baste freely and often; half an hour will be sufficient for the smallest, the larger in proportion. Wild ducks should be fat, the claws small, reddish and supple; if they are not fresh, on opening the beak there will be a disagreeable smell. The flesh of the hen is the most delicate. Pick them clean without scalding; cut the wings close to the body and empty it; cut off a part of the neck, and singe them nicely.

Having drawn wild ducks, wipe them well inside with a cloth, rub each outside and in with a mixture of pepper and salt, cut a slice of white bread, dip it in hot water, spread it thick with butter, sprinkle pepper over and put it in the body, sew it up, truss the legs close to the body and fasten them with skewers; then split them or lay them on a trivet in a dripping-pan; have a bright, clear fire that they may roast quickly; put half a pint of water in the pan, put to it a teaspoonful of salt and an onion sliced thin, baste with this ten or twelve minutes (to take off the fishy taste peculiar to wild ducks) throw it away, put half a pint of hot water in its place, put in a little pepper, baste the ducks with butter, dredge a little flour over and baste with the water in the pan; turn them that every part may be done. Half an hour, with a hot fire and frequent basting, will roast them nicely. Serve the ducks as hot as possible.

Whilst the ducks are roasting, boil the giblets tender in a little water, chop or mince them fine, add to the mince pepper and salt, a small bit of butter and a tablespoonful of browned flour, when the ducks are done put it in the pan with the gravy, set it over the fire, stir it for a few minutes, then serve in a

tureen. Make a glass of wine hot, put to it a tablespoonful of currant jelly and white sugar each, and serve with ducks, or put a wineglass of port in the pan; a few minutes before taking them up baste the ducks once or twice with it; add a tablespoonful of jelly and the gravy.

Or half roast wild ducks without seasoning. When they are brought to the table slice the breast, strew over pepper and salt, pour a little port wine over, or squeeze the juice of an orange or lemon over; add a bit of butter the size of an egg, sprinkle over a teaspoonful of fine white sugar, cut up the bird and set it over a chafing dish, turn it that it may be nicely done; or prepare it in this manner and set it on coals before a hot fire.

Canvas Back Ducks.—Canvas back ducks are served in the same manner as wild ducks, without the onion in the basting; as there is no disagreeable taste to destroy, that is not necessary. Canvas back ducks may be served the same as goose or tame duck. Roast them according to their size.

Venison.—The choice of venison is regulated by the fat, which when young is thick, clear and close. As it always begins to taint first towards the haunches, run a knife into that part; if it is tainted you will perceive a rank smell, and it will have a greenish appearance.

Venison Steak Fried.—Cut venison steaks from the leg or loin, half an inch thick, dip them in rolled crackers or wheat flour; make of lard and sweet butter equal parts, or beef drippings, half the size of an egg, hot in a frying pan, rub the steaks over with a mixture of pepper and salt, cover the pan and let them fry quickly, until one side is a fine brown, then turn the other, and finish frying without the cover; take care that they are not over done, then add to the gravy a glass of red wine, or a wineglass of hot water, with a tablespoonful of currant jelly, stir it over the fire for a few minutes, then put it in the dish with the meat, and serve as hot as possible. Steak dishes of block tin, with heaters, are used for beef or venison. Lean steaks of fat beef cooked in this way are equal to venison, for which the beef should be kept till ready to taint, then rinse them in cold water, wipe them dry, and finish as directed; the steaks should be cut small like venison.

Pork.—Spare-Rib. — Broil the blade-bone and spare-rib nicely over a bright clear fire of coals; let it be well done. It is best to cover it whilst on the gridiron, as by so doing it is sooner done and the sweetness is kept in. Put the inside to the fire first, and let it be done nearly through before turning it; when done, take it on a hot dish, butter it well, season with pepper and salt, and serve hot.

Sausage Meat.—Take of pork three-quarters, and one of beef, chop it fine, put four ounces of fine salt, and one of pepper to every ten pounds of meat; mix the seasoning well into the meat; then put it in small muslin bags, tie them close, and hang them in a dry, cool cellar. When wanted for use, cut it in slices, or form it in small cakes, flour the outside of each, and fry in hot lard. Let them be nicely browned. Serve with boiled vegetables. Fine hominy may be boiled and served with them for breakfast.

Pork Sausages.—Take such a proportion of fat and lean pork as you like, chop it quite fine, and for every ten pounds of meat take four ounces of fine salt, and one of fine pepper; dried sage or lemon thyme, finely powdered, may be added, if liked; a teaspoonful of sage, and the same of ground allspice and cloves, to each ten pounds of meat. Mix the seasoning through the meat, pack it down in stone pots, or put it in muslin bags. Or fill the hog's or ox's guts, having first made them perfectly clean, thus: empty them, cut them in lengths, and lay them three or four days in salt and water, or weak lime water; turn them inside out once or twice; scrape them; then rinse them and fill with the meat.

To Roast a Pig.—Thoroughly clean the pig; then rinse it in cold water, wipe it dry; then rub the inside with a mixture of salt and pepper, and, if liked, a little pounded and sifted sage; make a stuffing thus: cut some wheat bread in slices half an inch thick, spread butter on to half its thickness, sprinkled with pepper and salt, and, if liked, a little pounded sage and minced onion; pour enough hot water over the bread to make it moist or soft, then fill the body with it and sew it together, or tie a cord around it to keep the dressing in, then spit; put a pint of water in the dripping-pan, put into it a tablespoonful of salt, and a teaspoonful of pepper, let the fire be hotter at

each end than in the middle, put the pig down at a little distance from the fire, baste it as it begins to roast, and gradually draw it nearer; continue to baste occasionally, turn it that it may be evenly cooked; when the eyes drop out it is done; or a better rule is to judge by the weight, fifteen minutes for each pound of meat, if the fire is right.

Have a bright, clear fire with a bed of coals at the bottom; first put the roast at a little distance, and gradually draw it nearer; when the pig is done stir up the fire, take a coarse cloth with a good bit of butter in it, and wet the pig all over with it, and when the cracking is crisp take it up; dredge a little flour into the gravy, let it boil up once, and having boiled the heart, liver, etc., tender, and chopped it fine, add to it the gravy, give it one boil, then serve.

To Bake a Pig.—Prepare a pig as for roasting, and lay it on a trivet or on muffin rings in a dripping-pan, stick bits of butter all over it, sprinkle pepper and salt over, and dredge some flour over; put in a pint or more of water in the pan, then set it in a quick or hot oven, baste frequently, when nearly done, baste with a spoonful of butter, and close the oven to finish; then take it up, dredge a tablespoonful of flour to the gravy, set it over the fire to brown, stir it smooth, and if necessary add a little hot water, let it boil up once, then strain it and serve with the pig. Pig to roast or bake may be stuffed with boiled potatoes, seasoned with butter, pepper and salt, and made soft with a cup of milk.

Sauces to Serve with Roast Pig or Pork.—Mashed potatoes, boiled onions, turnips mashed, pickled beets, mangoes of cucumbers, or dressed celery and cranberry sauce, stewed apples or currant jelly.

To Roast a Loin.—Take a sharp penknife and cut the skin across, then cut over it in the opposite direction so as to form small squares or diamonds; rub every part of it with a mixture of salt and pepper, put bits of butter the size of a hickory nut over the skin side, and roast or bake it; serve with the gravy, boiled potatoes mashed, turnips mashed, and dressed celery or pickles, and tart apples stewed without sugar.

Pork Tender Loin.—This part of pork is the most deli-

cate; it may be got where pork is cut up for packing or salting. It may be fried or broiled; if it is too thick, split it in two. Steaks cut from the tender-loin are nice, but not equal to the tender-loin which is cut with the grain; steaks are cut across it. The chine of pork may be roasted.

Pig's Feet Soused.—Scald and scrape clean the feet; if the covering of the toes will not come off without, singe them in hot embers until they are loose, then take them off. Many persons lay them in a weak lime-water to whiten them. Having scraped them clean and white, wash them and put them in a pot of hot (not boiling) water, with a little salt, and let them boil gently, until, by turning a fork in the flesh, it will easily break, and the bones are loosened. Take off the scum as it rises. When done, take them from the hot water into cold vinegar, enough to cover them; add to it one-third as much of the water in which they were boiled; add whole pepper and allspice, with cloves and mace, if liked; put a cloth and tight-fitting cover over the pot or jar. Boil until the bones are loose. Soused feet may be eaten cold from the vinegar, split in two from top to toe; or, having split them, dip them in wheat flour and fry in hot lard, or broil and butter them. In either case, let them be nicely browned.

To Boil Ham.—Wash the ham in cold water two or three times, and put it into a kettle of hot (not boiling) water to cover it; let it boil gently according to its weight (fifteen minutes to each pound); it must be kept slowly boiling all the time; keep the pot covered, except to take off the scum as it rises; if it is likely to boil over, take the lid partly off.

Putting meat down to boil in cold water draws out its juices. Hard or fast boiling makes it tough and hard. Ham which has been smoked a long time, should be soaked over night. When it is done, take off the skin, trim off the under side neatly, and put spots of pepper, and stick cloves at regular intervals, over the whole upper surface; or dredge it well with wheat flour or rolled crackers, and brown it in a hot oven, or before a hot fire. Serve hot with the gravy from it and boiled vegetables; or it may be served cold. Trim the bone with parsley, or the delicate leaves of celery, and put sprigs of the same around it on the dish; lemon sliced and

dipped in flour or batter and fried, may be laid over the ham and on the dish. Mashed potatoes, stewed apple, or cranberry, celery, or boiled spinach, or cauliflower and mashed turnips are served with hot ham.

With cold ham serve pickles or dressed celery, or both, and bread and butter sandwich.

To Boil a Leg of Pork.—Take a leg of pork which has been in pickle for three or four days, soak it for half an hour in cold water to make it look white; then tie it in a nicely floured cloth, and put it in hot water to cover it. Boil the same as ham. When done, take a small sharp knife, and cut through the skin in a straight line about a quarter of an inch apart; put spots of pepper over and serve with the same vegetables as for ham; or with mashed potatoes, turnips mashed, and pickles or tart apples stewed without sugar. Currant jelly or cranberries may be served with ham or leg of pork.

Pig's Cheek—Is smoked and boiled like ham with vegetables; boiled cabbage or fried parsnips may be served with it.

Pork Chops, Steaks and Cutlets.—Fry or stew pork chops, after taking off the rind or skin, the same as for veal. Cutlets and steaks are also fried, broiled, or stewed, the same as veal.

To Fry or Broil Salt Pork and Bacon.—Cut some slices from corned pork, or streaked bacon (fat and lean), put them in a pan, pour boiling water over, set it over the fire, and let it boil up once; then pour the water off, and fry them in their own fat, sprinkle with pepper, and, if liked, a little dried sage, or thyme, pounded fine; when both sides are nicely browned, take them up, put a little hot water or some vinegar in the pan, let it boil up once, and put it in the dish with the meat. Or, having fried the meat, dredge a teaspoonful of flour into the gravy; while it is hot, stir it about; then add a little hot water, stir it smooth, and pour into the dish with the meat.

To Broil.—After having parboiled the slices with plenty of water in the pan, lay them on a gridiron, over a bright fire of coals; sprinkle a little pepper over; when both sides are done, put them on a hot dish, put a little butter over and

serve. Or, whilst broiling, dip the slices several times into a dish of hot water.

Salt pork is very nice fried thus: Cut it in thin slices, put them in the frying-pan with hot water to cover them; set it over the fire, let it boil up once, then pour off the water, shake a little pepper over the meat, and fry it nicely in its own fat, both sides; then take it up, add to the gravy a large teaspoonful of flour, stir it smooth; then put to it a cup of milk, stir over the fire for a few minutes, shake pepper over, and put it in the dish with the meat.

Cold boiled potatoes, sliced thin, may be fried in the pan, after pork or bacon, and served with it; parsnips boiled, cut in thin slices and fried, may also be served with fried salt meat. Or, having boiled some cabbage or spinach, and pressed all the water from it, cut it small, put it on a steak dish, lay the fried meat on it, and pour the gravy over. Vinegar is generally eaten with the vegetables.

To Fry Ham.—Cut some large slices from the large end of the ham, take off the skin, put them in a frying-pan, and pour hot water over; set if over the fire and let it boil up once, then pour the water off, take the slices up, put a spoonful of lard in the frying-pan and let it become hot; dip the slices in rolled cracker or wheat flour, and fry them a nice brown; when one side is done, turn the other; then take them on a dish, put a very little water in the pan, let it boil up once, put it over the meat. Or, if a flour gravy is wanted, make a thin batter with a teaspoonful of flour and cold water, and stir it into the gravy in the pan, let it brown, and, if too thick, put a little hot water to it, stir it smooth, and serve with the meat.

To Broil Ham.—Cut some slices of ham, quarter of an inch thick, lay them in hot water for half an hour, or give them a scalding in a pan over the fire, then take them up and lay them on a gridiron over bright coals; then take the slices on a hot dish, butter them freely, sprinkle pepper over and serve. Or, after scalding them, wipe them dry, dip each slice in beaten egg, and then into rolled crackers and fry or broil.

Ham Gravy.—When a ham is almost done with, cut off what meat remains on the bone, break or saw the bones small, and put it into a saucepan with hot water to cover it;

set the stewpan over the fire and let it simmer gently; then strain it, add a little pepper and fine sage, if liked, dredge in a tablespoonful of browned flour, and add a bit of butter; stir it over the fire for a few minutes; then, having toasted some slices of bread a nice brown, lay them in a dish and serve the gravy over. Or, serve ham gravy with boiled vegetables.

HAM AND EGGS FRIED.—Cut some nice slices of ham, put them in a frying-pan, cover them with hot water, and set the pan over the fire, let it boil up once or twice, then take out the slices and throw out the water; put a bit of lard in the pan, dip the slices in wheat flour or rolled crackers, and, when the fat is hot, put them in the pan, sprinkle a little pepper over; when both sides are a fine brown, take them on a steak dish, put a little boiling water into the pan, and put it in the dish with the meat.

Now put a bit of lard the size of a large egg into the pan, add a saltspoonful to it, let it become hot; break six or eight eggs carefully into a bowl, then slip them into the hot lard, set the pan ever a gentle fire; when the white begins to set, pass a knife blade so as to divide an equal quantity of white to each yolk, cut it entirely through to the pan that they may cook the more quickly; when done, take each one up with a skimmer spoon, and lay them in a chain around the meat on the dish. Fried eggs should not be turned in the pan.

POACHED EGGS WITH FRIED HAM.—Fry the ham as above directed, take a clean frying or omelet pan, nearly fill it with boiling water, set it over a gentle fire, break the eggs singly into a cup and slip each one into the boiling water, cover the pan for four or five minutes; when done, take them up with a skimmer on to a dish, sprinkle a little pepper and salt over, add a small bit of butter, and serve in a dish or over the ham.

PORK AND BEANS.—Take two quarts of dried white beans (the small ones are best), pick out any imperfections, and put them to soak in hot water, more than to cover them, let them remain one night; the next day, about two hours before dinner time, throw off the water, have a pound of nicely corned pork; a rib piece is best; put the beans in an iron dinner-pot, score the rind or skin of the pork in squares or diamonds, and lay it on the beans, put in hot (not boiling) water to cover them, add

a small dried red-pepper, or a saltspoonful of cayenne, cover the pot close, and set it over a gentle fire for one hour; then take a tin basin or earthen pudding-pan, rub the inside over with a bit of butter, and nearly fill it with the boiled beans, lay the pork in the centre, pressing it down a little, put small bits of butter over the beans, dredge a little flour over them and the pork, and set it in a moderately hot oven for nearly one hour.

Serve in the dish in which it was baked, thus: Lay a nicely fringed small napkin on a dinner plate, set the basin or pan on that, turn the corners of the napkin up against it, and keep it in place by sprigs of green parsley or celery leaves on the plate under it, and so continue a wreath around the dish, concealing the pan entirely. Serve pickles and mashed potatoes with it.

Succotash.—Take of dried sweet corn and white beans, one quart of dried sweet corn to one or two of beans. Put the beans to soak in a basin with water to cover them; rinse the corn in cold water, and put them in a basin with water to cover it, let them remain until the next day; within two hours of dinner time, pour the water from the beans, pick out any imperfections, and put them with the corn, with the water in which it is soaked, into a dinner-pot; cut a pound of nicely corned pork in thin slices, put it to the corn and beans, and put over them hot water, rather more than to cover them, add a very small red pepper, or a saltspoonful or cayenne, and cover the pot close; set it where it will boil very gently, for an hour and a half, then put it in a deep dish, add a bit of butter to it and serve. The pork may be scored, and not cut up, if preferred, and served in a separate dish.

To Boil Salted or Corned Beef.—Wash the brine from a piece of corned beef and put it in a pot of hot (not boiling) water, take off the scum as it rises, then try if it is tender; let it boil gently. When it is done, take it up and press it between two plates.

Cabbage, or spinach, or some other greens, are generally boiled with salt beef; put down the beef in time that it may be done before it is time to boil the vegetables, and set it to press while the vegetables are boiling.

To Prepare the Cabbage.—Take off the discolored outside leaves, and cut each head in four; look well between the leaves to see that no insects are secreted; wash the quarters, and put them in the water in which the meat was boiled; set it over the fire and let it boil fast for three quarters of an hour; if you wish the potatoes boiled with it, choose large, equal sized ones, and put them in with the cabbage; when they are done take the potatoes into a covered dish, put the cabbage into a cullender, press out all the water. If you wish to have the meat hot, after pressing it, put it into the pot ten minutes before taking up the vegetables. Serve the cabbage and potatoes in covered dishes, and the meat on an oval dish.

Parsnip Stew.—Cut half a pound of fat salt pork or bacon in slices, and a pound of beef or veal in bits, put them in a dinner-pot with very little water. Scrape some parsnips, and cut them in slices an inch thick, wash and put them to the meat; pare and cut six small sized potatoes in halves. Cover the pot close and set it over a bright fire for half an hour; then dredge in a tablespoonful of wheat flour, add a small bit of butter, and a small teaspoonful of pepper, stir it in, and set it over the fire to brown for fifteen minutes. Take the stew into a dish and serve.

Lamb.—To Choose Lamb.—The vein in the neck of a fore-quarter of a lamb will be a fine blue, if it is fresh; if it is of a green or yellowish color it is stale.

The hind-quarter first becomes tainted under the kidney.

A fore-quarter includes the shoulder, neck and breast.

The pluck is sold with the head, liver, heart and lights. The melt is not used with us.

The fry contains the sweet-breads, skirts, and some of the liver.

Lamb may be hashed, stewed, roasted, fried, broiled, or made in a pie, the same as veal.

To Broil a Breast of Lamb.—Have a clear, bright fire of coals; when the gridiron is hot rub it over with a bit of suet, then lay on the meat, the inside to the fire first, let it broil gently, when it is nearly cooked through turn the other side; let it brown nicely, put a good bit of butter on a steak dish,

work a large teaspoonful of salt and a small one of pepper into it, lay the meat upon it, turn it once or twice, and serve hot. The shoulder may be broiled in the same manner.

Lamb Stewed with Peas.—Cut the scrag or breast of lamb in pieces, and put it in a stewpan with water enough to cover it. Cover the stewpan close, and let it simmer or stew for fifteen to twenty minutes; take off the scum, then add a tablespoonful of salt and a quart of shelled peas; cover the stewpan and let them stew for half an hour; work a small tablespoonful of wheat flour with a quarter of a pound of butter, and stir it into the stew; add a small teaspoonful of pepper; let it simmer together for ten minutes. Serve with new potatoes, boiled. A blade of mace may be added if liked.

Quarter of Lamb Roasted.—Wash a quarter of lamb with cold water, mix a large tablespoonful of salt, and a heaping teaspoonful of pepper, and rub it well over every part of the meat; then split it, or lay it on muffin rings or a trivet in a dripping-pan; put a pint of water in the pan to baste with, set it before the fire in a Dutch oven or reflector, or in a hot stove oven, baste very often after it begins to roast; lay it so that the thickest part may be nearest the fire; allow fifteen minutes for each pound of meat; baste with the water in the pan until nearly done; add more to it as it wastes, then put to it a quarter of a pound of butter, baste the meat with it, dredge it white with flour, stir up the fire to brown it.

To Prepare a Quarter of Lamb For Broiling.—Wash a quarter of lamb in cold water, then rub it all over with a mixture of salt and pepper, dredge well with wheat flour, and put in a pot of hot (not boiling) water; cover the pot and let it boil gently, allowing fifteen minutes for each pound of meat; take off the scum as it rises. Served with boiled potatoes and parsley, or drawn butter sauce, and mint sauce, and lettuce dressed. Break the leaves from some white heart lettuce and rinse each one in cold water, then cut them small, put a teaspoonful of made mustard with a teaspoonfnl of sugar, and the same of oil, beat them together in a cup; then add enough vinegar to fill a cup, and pour it over the lettuce.

Mutton.—Observations on Mutton.—The pipe which runs along the bone inside of a chine or saddle of mutton, must be taken out. If it is to be kept any length of time, wipe the meat perfectly dry, and rub pepper over it in every part. Whenever you find any moisture, wipe it dry, rub it with pepper, and dredge flour over. The kernels should be taken out by the butcher.

Mutton for roasting or steaks should hang as long as it will keep without tainting. Let it hang in the air in a cool, dry place. Pepper will keep flies from it. The chine or rib bones should be wiped every day. The bloody part of the neck should be cut off. In the breast the brisket changes first. In the hind quarter, the part under and about the kidneys is first to taint. Mutton for stewing or broiling should not be so long kept. It will not be so fine a color if it is. The lean of mutton should be a clear red, fine, close grain, and tender to the touch. The fat should be firm and white. Skewer a piece of letter paper over the fat of mutton whilst roasting. When nearly done, take it off.

Haunch of Mutton.—Keep the haunch as long as you can, and have it sweet, wash it in vinegar and water before dressing it. Before putting the meat to the fire, rub it all over with a mixture of pepper and salt; make a stiff paste of wheat flour and water, roll it thin, and put it over the meat; have a large, bright fire, and set the meat at a little distance from it (allow fifteen minutes to each pound of meat); when half done, take off the paste, draw it nearer the fire, and baste freely with water from the pan; turn it so that every part may be done; half an hour before taking it up, stir up the fire, put quarter of a pound of butter in the pan, baste with it, dredge the meat white with flour, baste again, turn the meat over, baste freely, and dredge more flour over, and baste again; the fire must be bright for finishing. When done, take it up, put the dripping-pan over the fire, cut a lemon in thin slices into it, dredge in a large tablespoonful of browned flour, stir it smooth for ten minutes, then strain into a gravy tureen, and serve with the slices of lemon. Or, instead of a lemon, put a wineglass of port wine to the gravy.

Boiled potatoes, asparagus; or spinach, dressed celery, and currant jelly, is served with roast mutton.

Putting the paste over the meat keeps in its juices, and therefore makes it sweeter. A gravy may be made of a pound of loin of mutton, cut small and simmered in a pint of water till reduced to half; salt it a little, stir in a teaspoonful of browned flour and a little pepper; let it boil up once, then strain it, and serve with the meat and currant jelly.

A Shoulder of Mutton.—Broil a shoulder of mutton over a clear, bright fire of coals, let it broil gently, putting the inside to the fire first, cover it with a tin; when nearly done through, turn it; let it brown nicely; when it is done, take it on to a hot steak dish, sprinkle a small tablespoonful of salt and a teaspoonful of pepper over; butter it freely, turn it once or twice in the seasoning, turn the inside down, cover it with a tin cover, and serve hot, with boiled hominy, or potatoes, for breakfast. The shoulder may be boned, before broiling.

To Broil a Breast of Mutton.—Parboil a breast of mutton, then wipe it dry, and broil it as directed for shoulder.

Mutton Chop Fried.—Cut some fine mutton chops without much fat; rub over both sides with a mixture of salt and pepper, dip them in wheat flour or rolled crackers, and fry in hot lard or beef drippings; when both sides are a fine brown, take them on a hot dish, put a wineglass of hot water in the pan, let it become hot, stir in a teaspoonful of browned flour, let it boil up once, and serve in the pan with the meat. A tablespoonful of currant jelly may be stirred into the gravy, or a wineglass of port wine instead of water. Or, cut a lemon in thin slices, take out the pits, and fry them brown with a bit of butter in the pan, dredge in a teaspoonful of browned flour, add a wineglass of hot water, stir it for a few minutes over the fire, then serve in the dish with the meat.

Leg of Mutton Boiled.—Wash a leg of mutton, dredge it well with flour, and wrap it in a cloth, then put it in a pot of hot water, and boil according to its weight. Serve with drawn butter or parsley sauce, with boiled vegetables and pickles.

Eggs.—To Choose Eggs.—Fresh eggs, when held to the light, the white will look clear, and the yellow distinct; if not good, they will have a clouded appearance.

When eggs are stale, the white will be thin and watery, and

the yolk will not be a uniform color, when broken; if there is no mustiness, or disagreeable smell, eggs in this state are not unfit for making cakes, puddings, etc.

Eggs for boiling should be as fresh as possible; a new laid egg will generally recommend itself, by the delicate transparency of its shell.

To Boil Eggs.—Wash the shells clean in cold water before boiling; have a stewpan of boiling water, into which put the eggs; keep it boiling—four minutes for very soft—five, that the yolk only may be soft—six minutes will boil the yolk hard, for eating. Eight minutes are required to boil eggs for salad or garnish. When done, take them from the boiling water, into a basin of cold water, which will prevent the yolk turning dark or black.

Egg Omelet.—Five well-beaten eggs, one and a half cups of milk, three tablespoonfuls of flour; mix the flour in a little milk, and rub smooth, then add milk and flour to eggs, and beat well together; grease well with lard a frying-pan; put in when not very hot, a large teaspoonful, it will cover about half; turn with knife when light brown, and roll up as it browns.

Ham Omelet.—One-half pint of milk, two teaspoonfuls of flour, three teaspoonfuls of cracker crumbs, six eggs. Put thinly and evenly over the griddle; then immediately scatter over it finely minced ham. Double it, then fold again in a quarter circle.

Omelet.—Set a smooth frying-pan on the fire to heat; break five eggs into a bowl; put butter the size of an egg into a heated pan, give twelve strong beats to your eggs, and, when the butter begins to boil, pour in the eggs. Draw up the eggs from the bottom of the pan, but do not stir, simply shake the pan. When the bottom is well done, and the top a little soft, fold over and put on a platter. Serve immediately. This may be varied by the addition of three tablespoonfuls of milk.

Baked Eggs.—Six eggs, four tablespoonfuls of good gravy, veal, beef or poultry; the latter is particularly nice; one handful of bread crumbs, six rounds of buttered toast or fried bread. Put the gravy into a shallow baking dish, break the eggs into this, pepper and salt them, and strew the bread

crumbs over them. Bake for five minutes in a quick oven. Take up the eggs carefully, one by one, and lay upon the toast, which must be arranged on a hot, flat dish. Add a little cream, and, if you like, some very finely chopped parsley and onion to the gravy left in the baking dish, and turn it into a saucepan. Boil up once quickly, aud pour over the eggs.

Eggs Sur le Prat.—Six eggs, one tablespoonful of butter, or nice dripping, pepper and salt to taste. Melt the butter on a stone china or tin plate, or shallow baking dish. Break the eggs carefully into this, dust lightly with pepper and salt, and put into a moderate oven until the whites are well set. Serve in the dish in which they were baked.

Eggs Poached in Balls.—Put three pints of boiling water into a stewpan; set it on a hot stove or coals; stir the water with a stick until it runs rapidly around, then having broken an egg into a cup—taking care not to break the yolk—drop it into the whirling water, continue to stir it until the egg is cooked; then take into a dish with a skimmer and set it over a pot of boiling water; boil one at a time, until you have enough. These will remain soft for a long time. Or, put some hot water in a frying pan; break in the eggs; let it set over the fire, without boiling, until they are done; then serve on toast.

Sweet-Breads.—Veal Sweet-Breads—Spoil very soon; the moment they come from the butcher's they should be put in cold water to soak for about an hour; lard them or draw a lardoon of pork through the centre of each one; put into salt boiling water or stock and let boil for fifteen or twenty minutes; throw them into cold water for only a few moments, they will now be firm and white; remove carefully the skinny portion and pipes.

Sweet-Breads Stewed.—Wash carefully, remove all bits of skin and fatty matter, cover with cold water and heat to a boil; pour off the hot water and cover with cold until the sweet-breads are firm. If liked, add butter as for frying before you put in the second water; stir in a very little water the second time. When they are tender, add for each sweet-bread a heaping teaspoonful of butter, a little chopped parsley, pep-

per, salt, and a little cream. Let them simmer in this gravy for five minutes. Send to table in a covered dish with the gravy poured over them.

Sweet-Breads Roasted. — Parboil and put into cold water for fifteen minutes; change to more cold water for five minutes longer; wipe perfectly dry, lay them in a dripping-pan and roast, basting with butter and water until they begin to brown; then withdraw them for an instant, roll in beaten egg, then in cracker crumbs, and return to the fire for ten minutes longer, basting meanwhile twice with melted butter. Keep hot in a dish while you add to the dripping half a cup of hot water, some chopped parsley, a teaspoonful of browned flour and the juice of half a lemon. Pour over the sweet-breads and serve at once.

Broiled Sweet-Breads.—Parboil and blanch by putting them first in hot water and keeping it at a fast boil for five minutes. Then plunging it into ice cold water, a little salted. When the sweet-breads have lain in this ten minutes, wipe them very dry, and with a sharp knife split them each in half lengthwise. Broil on a clear, hot fire, turning every minute as they begin to drip. Have ready on a deep plate some melted butter, well salted and peppered, mixed with catsup or pungent sauce. When the sweet-breads are done to a fine brown, lay them in this, turning them over several times, and set covered in a warm oven. Lay toast upon a plate or chafing-dish and a sweet-bread on each, and pour the hot butter, in which they have been lying, over them, and send to the table.

Vegetables.—Potatoes.—To be able to boil a potato perfectly is one of the tests of a good cook, there being nothing in the whole range of vegetables which is apparently so difficult to accomplish. Like the making of good bread, nothing is simpler when once learned. A good, boiled potato should be white, mealy, and served very hot. If the potatoes are old, peel thinly with a sharp knife; cut out all spots, and let them lie in cold water some hours before using. It is more economical to boil before peeling, as the best part of the potato lies next the skin; but most prefer them peeled. Put on in boiling water, allowing a teaspoonful of salt to every quart of water.

Medium sized potatoes will boil in half an hour. Let them be as nearly of a size as possible, and, if small and large are cooked at the same time, put on the large ones ten or fifteen minutes before the small. When done, pour off every drop of water; cover with a clean towel, and set on the back of the range to dry for a few minutes before serving. The poorest potato can be made tolerable by this treatment. Never let them wait for other things, but time the preparation of dinner so that they will be ready at the moment needed. New potatoes require no peeling, but should merely be well washed and rubbed.

Potato Snow.—Mash fine, and rub through a colander into a very hot dish, being careful not to press it down in any way, and serve hot as possible.

Browned Potato.—Mash well boiled potatoes finely; mix with them, as you do so, a palatable allowance of butter and salt; nice beef dripping will do instead of butter; put into tin baking plates, and set in a hot oven till well browned. Give them twenty minutes' time.

Cream Potato.—Mash finely; salt well; stir in a cupful of scalded cream to a dishful made with ten large sized potatoes; add a little butter, by taste. Do all this in the hot pan they were steamed off in. Keep hot over the fire, where it cannot burn. Serve as soon as possible.

Rice.—Wash and rinse repeatedly in cold water, till very white. Pick out all discolored grains, and other refuse articles. The best rice ought not to need much picking over. Let it soak in the last water an hour or more. Drain off all the water, and dry the rice on a large towel. Prepare it long enough beforehand to allow of its remaining awhile spread out on the cloth to dry more perfectly. It must not dry hard; simply let all the actual water be absorbed from it, leaving the kernels separate, and with a beginning of swelling and softning from the moisture. Have a kettle with a good deal of boiling water in it. The rice must have room to scatter in it as it boils. See that it does scatter, by frequently stirring it up from the bottom with a fork. Never stir rice with a spoon. Let it boil fifteen minutes; then try a grain or two by tasting;

the moment you find it tender enough to bite through without any feeling of hardness or rawness, take the kettle off, and pour the water away through a fine colander or vegetable strainer. Set the strainer, with the rice in it, on the back of the stove for about ten minutes, to let the grains dry perfectly.

All depends upon the plenty of water, and the instant watching of the rice to detect the exact point of its sufficient softening. It must not boil a minute after you can bite it as before said.

Macaroni.—Wash and soak like rice, having broken it up into lengths of six or eight inches. Wipe dry and put into a plenty of boiling water. Boil half an hour, in salted water. Meanwhile, for an average dishful, cream two tablespoonfuls of butter, scald a teacupful of cream, or rich milk, stir the hot cream gradually to the butter, adding a heaping saltspoonful of salt. Do not mix these till the macaroni is ready to be taken up. Turn off all the water carefully from the macaroni, pour the butter and cream upon it in the kettle, and set it back on the fire to turn it over in the dressing. Then dish for the table.

Tomatoes.—Stewed: Pour boiling water over them, to take the skins off. Peel them nicely and cut them up. Put them into a saucepan with a little butter, allow a round tablespoonful to half a dozen tomatoes; salt, half a teaspoonful to as many; and a sprinkle of pepper. Stew three quarters of an hour. As they boil, after cooking about half an hour, dredge over, and stir in, two or three sprinkles of flour. Or, if you prefer, scatter and stir in fine cracker crumbs, until thickened a little.

Fried: Mix together in a dish a little flour, pepper, and salt. A pinch of pepper and a large saltspoonful of salt to three tablespoonfuls of flour. Slice the tomatoes without skinning; lay each slice in the flour, turning it over to flour it well; or put your flour, pepper, and salt into a little sifter or sprinkler, and dredge each tomato slice on both sides.

Put enough butter into a frying-pan to cover the bottom when melted, let it heat till it sizzles, and then lay in the slices of tomato. Fry brown.

Broiled: Slice the tomatoes without peeling. See that your fire is clear and hot. Put the slices in a wire toaster, and toast, carefully, like bread, or like broiling steak; turning often, to keep the juice in. Bring them to a nice, decided brown on both sides. Lay the slices in a dish, dropping on the middle of each one a bit of butter, and giving it a dust of salt and pepper. Send to the table as hot as possible.

Baked: Scald, peel, and slice. Butter a baking dish. Have ready a cupful of fine cracker crumbs. Put a layer of tomatoes in the dish, sprinkle them with pepper and salt, the former cautiously; drop a bit of butter on each slice, and strew cracker crumbs over the whole. Proceed in this way until you have used all your tomatoes, or filled the dish. Finish with a good sprinkle of crumbs, and drop bits of butter over the top. Bake an hour.

Canned tomatoes: May be stewed or baked in the same way as fresh ones.

CAULIFLOWER.—Pick off the leaves; trim down the stalk; put the cauliflower in cold water. An hour before dinner, put it into a large porcelain kettle, or nice tin boiler, with a great deal of boiling water, salted. Let it boil steadily, but not in a furious manner, to toss and bruise it, for one hour. Prepare for it a cream butter sauce, without the spicing of mace. Take up the cauliflower carefully, with a large vegetable skimmer or wire ladle. Put it in the dish for table, and pour over it the cream sauce.

CABBAGE.—Wash it, examining it carefully, and stripping off the old outside leaves. Let it lie for an hour or two, as convenient, in cold water. Put it into a large potful of boiling water. Have a plenty more of boiling water, to renew with, as below. When it has boiled half long enough—see "Time-Table," for old and young cabbages—turn away all the water, and fill the pot with more; throwing in two or three spoonfuls of salt. Let it boil the remainder of the time, then take it out carefully upon a drainer, let the water run from it, and serve. A drawn butter sauce is nice, poured over it. Or, when well boiled, chop it fine, put it in a saucepan, stir butter with it, and sprinkle in a little pepper, put it on the fire, and stir it till boiling hot again. Or, chop and dress like cauliflower.

FRIED POTATOES.—Pare and slice the potatoes thin—if sliced in small flakes they look more inviting than when cut in larger pieces—keep in ice water two or three hours; then drain them dry, or dry them on a crash towel, and drop them into boiling lard; when nearly done take them out with a skimmer and drain them. Let them get cold, and then drop them again into boiling lard, and fry until well done. This last operation causes them to swell up and puff out; sprinkle with salt, and serve hot—our recipe says; but many like them cold as a relish for tea or with cold meats.

SARATOGA POTATOES.—Peel good sized potatoes and cut as thin as your cabbage cutter will slice them, and throw into cold water. After soaking an hour wipe them dry, and drop into boiling lard until a light brown. Skim them out into a colander and sprinkle with salt while hot. A wire basket is better to boil in, if you have it.

POTATO PUFF.—Stir two cupfuls of mashed potatoes, two tablespoonfuls of melted butter and some salt to a light, fine and creamy condition; then add two eggs, well beaten (separately) and six tablespoonfuls of cream; beat it all well and lightly together; pile it in a rocky form on a dish; bake it in a quick oven until nicely colored; it will puff up quite light.

CREAMING POTATOES.—Slice cold boiled potatoes very thin, have ready a saucepan of boiling milk, in which place the potatoes, with salt, a good sized piece of butter, and while boiling, thicken with flour, mixed with water, stirring until delicate and creamy; when ready dish for the table. The goodness of this dish depends much upon catering, just when ready; ten minutes being sufficient to prepare it.

OYSTER PLANT.—Scrape the root, dropping each into cold water as soon as cleaned. Exposure to the air blackens them. Cut in pieces an inch long, put into a saucepan with hot water to cover them, and stew until tender. Turn off the water and add soup stock enough to cover them. Stew ten minutes after this begins to boil; put in a great lump of butter cut into bits and rolled in flour. Boil up once, and serve.

FRIED SALSIFY OR MOCK OYSTERS.—Scrape the roots thoroughly and lay in cold water ten or fifteen minutes. Boil

whole until tender, and, when cold, mash with a wooden spoon to a smooth paste, picking out all the fibers. Moisten with a little milk, add a tablespoonful of butter, and an egg and a half for every cupful of salsify. Beat the egg light. Make into round cakes, dredge with flour and fry brown.

Cooking Carrots.—Cut the carrots in small pieces and stew in a little water until tender; pour off what water is left; put in milk enough to make a sauce, and a good lump of butter rolled in flour; boil up again altogether, having added salt and pepper to taste. Celery is excellent prepared in the same way.

Potato Fritters.—Mash and rub through a colander six good boiled potatoes; add a little salt, two tablespoonfuls of flour, one egg and the yolks of two others; beat the reserved whites to a stiff froth and stir it into the other ingredients, after they are well mixed; have ready a spider of hot lard, and drop by the spoonful, and boil as other fritters. This is a delicious breakfast dish.

Mashed Potatoes.—Potatoes are not good for mashing until they are full grown; peel them and lay them in water for an hour or more before boiling, for mashing.

Old potatoes, when unfit for plain boiling, may be served mashed; cut out all imperfections, take off all the skin and lay them in cold water for one hour or more; then put them into a dinner pot or stewpan, with a teaspoonful of salt, cover the stewpan and let them boil for half an hour unless they are large, when three-quarters of an hour will be required; when they are done, take them up with a skimmer into a wooden bowl or tray, and mash them fine with a potato-beetle; melt a piece of butter the size of a large egg into half a pint of hot milk, mix it with the mashed potatoes until it is thoroughly incorporated, and a smooth mass; then put it in a deep dish, smooth the top over, and mark it neatly with a knife; put pepper over and serve. The quantity of milk used must be in proportion to the quantity of potatoes.

Mashed potatoes may be heaped on a flat dish; make it in a crown or pineapple; stick a sprig of green celery or parsley in the top; or, first brown it before the fire or in an oven. Mashed potatoes may be made a highly ornamental dish; after

shaping it as taste may direct, trim the edge of the plate with a wreath of green celery leaves or parsley; or first brown the outside before the fire or in an oven.

HASHED POTATOES.—Peel and chop some cold boiled potatoes, put them into a stewpan with a very little milk or water to moisten them, put to them a small bit of butter and pepper and salt to taste, cover the stewpan close, and set it over a gentle fire for ten or fifteen minutes; stir them once or twice whilst cooking. Serve hot for breakfast.

SWEET, OR CAROLINA POTATOES.—The best sweet potatoes are from the Southern States; those raised in New Jersey are not nearly as sweet as those from the South.

The best manner of serving sweet potatoes is roasted or baked.

TO BAKE SWEET POTATOES.—Wash them perfectly clean, wipe them dry, and bake in a quick oven, according to their size—half an hour for quite small-sized, three-quarters for larger, and a full hour for the largest. Let the oven have a good heat, and do not open it unless it is necessary to turn them, until they are done.

ROASTED SWEET POTATOES.—Having washed them clean and wiped them dry, roast them on a hot hearth as directed for common potatoes, or put them in a Dutch oven, or tin reflector. Roasted or baked potatoes should not be cut, but broken open and eaten from the skin, as from a shell.

TO BOIL SWEET POTATOES.—Wash them perfectly clean, put them into a pot or stewpan, and pour boiling water over to cover them; cover the pot close, and boil for half an hour, or more if the potatoes are large; try them with a fork; when done, strain off the water, take off the skins, and serve.

Cold sweet potatoes may be cut in slices across or lengthwise, and fried or broiled as common potatoes; or they may be cut in half and served cold. Sweet potatoes are made pie of, the same as pumpkin pie.

YOUNG TURNIPS.—Cut off the green leaves of new turnips, leaving an inch or more of the stalk; pare them, and trim them neatly, put them into a pot of boiling water, with a teaspoonful of salt; cover the pot, and let them boil fast for half an hour,

or until perfectly tender; put butter and pepper over, and serve hot. Or serve with drawn butter over.

Ruta Baga—Or large winter turnip, may be cut in quarters or slices, and boiled with meat, and served with a little butter and pepper over; or boil in water with a little salt; take off the thick outside rind, and cut them in quarters and slices, and boil them for half an hour or more, until they are soft; then drain off the water and mash them fine, add a bit of butter and pepper to taste, work them smooth, then put them into a covered dish, smooth the upper surface over, and mark it with a knife-blade in flutes, meeting in the centre, or make it in a pyramid or pineapple, and serve.

Summer Squash.—Young green squashes must be fresh to be fit for eating; if they are so, the outside will be crisp when cut with the nail. Cut them in quarters, and if not very tender, pare off the outside skin; take the seed and strings from the inside, and cut the squashes small; then put them into a stewpan, with a teaspoonful of salt to a common-sized squash; pour boiling water on nearly to cover them, cover the stewpan, and let them boil fast, until they are tender; half an hour is generally enough; take them from the water into a colander with a skimmer, press the water from them, then take them on to a dish, mash them smooth, add a bit of butter and pepper to taste, put them into a dish and serve.

Winter Squash.—Cut the large yellow or winter squash small, take off the outside skin and the inside strings and seeds; then put it into a stewpan, with hot water to cover it; cover the stewpan for half an hour or longer until they are tender; take them into a colander with a skimmer, press out the water; then take them into a dish and mash them perfectly smooth; add a good bit of butter, and pepper and salt to taste; make it in a neat form, the same as mashed turnips or potatoes, but do not brown it; put pepper over in spots, and garnish with sprigs of parsley, or celery leaves, if you wish it ornamental.

Sprouts and Greens.—Cabbage sprouts, young beet tops, and the green leaves of young turnips, or boiled with salt meats, or in clear water, with a little salt.

Beets.—Winter beets should be put in cold water over

night to take off the earthy taste which they are apt to have; before boiling wash them clean, put them into a pot of boiling water, and boil fast; if not very large, one hour will be sufficient for them; should they be very large, one hour and a half or two hours will be required; when done, take them into a pan of cold water, rub the skins off with the hands, and cut them in thin slices; put them into a deep dish, strew a little salt and pepper over, and pour on cold vinegar nearly to cover them; prepare them an hour before serving, with roasted or fried meat; if to be served with cold or boiled meat, make a cup of vinegar hot, put a large tablespoonful of butter to it; add pepper and salt to taste, and serve hot. Winter beets may be cut in halves or quarters, and pickled by covering them with cold vinegar.

Beets must be washed, but never cut before boiling, else they will lose their fine color.

SPINACH.—Take off every discolored leaf from the bunches; put them into a large pan or pail of water, and wash each cluster of leaves separately, shaking it well in the water, otherwise it will be gritty and sandy; washing it in this way through two waters, will generally be enough; have a large kettle of water boiling fast, put in the spinach; cover the pot and let it boil fast for fifteen minutes, it will sink when done; then take it into a colander with a skimmer, press the water from it, cut it small with a knife, press it again, put a good bit of butter and a little pepper to suit; put it into a deep dish, smooth the surface over, let it rise high in the center, cut a cold boiled egg in slices and lay them over, serve hot with a cover; or it may be served on a flat dish; put it neatly on, lay hard boiled and sliced egg over. Spinach is boiled with salt beef, pork or ham. After the meat is done, take it up and press it between two plates that it may be cut nicely; meanwhile put the spinach into the pot, let it boil fast for fifteen minutes, then take it into a colander, press all the water from it, cut it small and serve with the meat. To be served with fried meat and gravy; boil it in water with a teaspoonful of salt, press the water from it and serve.

GREEN PEAS.—Shell green peas until you have a quart; half a peck in the shells will generally produce a quart of shelled peas. Put boiling water to cover them, add a teaspoon-

ful of salt, cover the stewpan, and boil fast for half an hour; then take one between your fingers, if it will mash easily they are done; drain off the water, take them into a deep dish, put to them a teacupful or less of sweet butter, and a little pepper; a small teaspoonful of white sugar is a great improvement; serve hot. Small young potatoes, nicely scraped, may be boiled and served with them, or in a separate dish with a little butter over.

Lamb and peas are a favorite dish in the spring of the year; they are nice with poultry, veal and mutton. A bit of saleratus or carbonate of soda, the size of a pea, put with green vegetables, improves the color and renders them more healthful; fast boiling keeps the color good.

Asparagus.—Choose green stalks of asparagus, the largest are best; cut off the white, tough part, wash the green in cold water, and tie it in small bundles that they may be taken up without danger of breaking, put them in hot water with a teaspoonful of salt, and let them boil for half an hour; toast some thin slices of bread a delicate brown, cut off the extreme outside crust, butter each slice frequently; and then lay them on small oval dishes; untie the asparagus and lay it on the toast, butter it a little, sprinkle pepper over and serve. Or it may be served without the toast; the toast may be moistened by putting a little of the water in which the asparagus was boiled, over it.

Vinegar is eaten with asparagus; it is generally added at table by such as like it. Asparagus may be laid on plain toast, and a little drawn butter poured over both.

Green Beans.—Cut the bud and stem end off, and take the strings from the sides of stringed beans, cut them in inch lengths, wash them in cold water, then put them into a stewpan of hot water, add a teaspoonful of salt, cover the stewpan and let them boil fast for half or three-quarters of an hour; take one up, if it will mash easily when pressed between the thumb and finger, they are done. Drain off the water, add sweet butter and pepper to taste, cut some nicely toasted bread in squares or diamonds, lay them on a dish, and serve the beans over. Green beans, when good, will be a bright color, and crisp, when broken. They should be fresh picked.

Beans and Corn, Called Succotash.—Take the husks

and silk from a dozen ears of sweet corn, and with a sharp knife cut the kernels from the cob, scrape gently what remains on the cob with the knife blade, string a quart or more of green beans and cut them in inch lengths or shorter; wash them and put them to the corn; put them with the corn into a stewpan, add half a pint of boiling milk or water, cover it close and let them boil rather gently for three-quarters of an hour, then add a teacupful of butter, a teaspoonful of salt, and a saltspoonful of pepper; stir them well together, cover it for ten minutes, take the beans and corn into a dish, with more or less of the liquids as may be liked.

This may be made without butter by substituting half a pound of nicely corned fat pork, washed in cold water, and cut in slices as thin as a knife blade. No other salt is required. Lima beans and sweet corn make the finest succotash.

Lima Beans.—Lay a quart of shelled Lima beans in cold water for one hour, then put them into a stewpan and pour water over to cover them, cover the stewpan and let it boil fast for half an hour; then take one between your finger and thumb; if it will mash easily, it is done; drain off nearly all the water, add a small teacupful of butter, a teaspoonful of salt, and a little pepper; cover them for a few minutes over the fire, then serve hot.

Old or Winter Carrots—Must be scraped and washed clean, then boil them tender, slice them, and serve with butter, pepper and salt over. Carrots may be sliced before boiling, and served in the same manner. Carrots are mostly used for soups.

Green Corn.—Cut the center of kernels through lengthwise with a sharp knife; scrape the inside out with the back of the knife; put over and boil with a very little water. After cooking ten minutes, add milk, salt, a very little sugar, and plenty of butter, and let boil gently for five or ten minutes more.

Corn Oysters.—One dozen grated ears of sweet corn, three tablespoonfuls of cream, two do. of flour, one do. of melted butter, one egg well beaten; mix and bake in small cakes on a griddle. These are very nice for tea when made from cold boiled ears of corn left over from dinner.

Egg Plant.—Slice the egg plant about half an inch thick, parboil in salt and water for about a quarter of an hour; then take out and fry in part butter and part lard. These are nice also when each plant is dipped in beaten egg and bread crumbs, and then fried.

Boiled Cauliflower.—To each half a gallon of water allow one heaped teaspoonful of salt. Choose cauliflowers that are close and white. Trim off the decayed outside leaves, cut the stalks off flat at the bottom. Open the flowers a little to remove the insects, and let lie in salt and water, with the head down, for an hour before cooking; then put them into fast boiling water, with the addition of salt as above. Skim well and boil till tender. Serve with melted butter or delicate drawn butter poured over.

Cabbage Jelly.—Boil a cabbage in the usual way, and squeeze in a colander till perfectly dry, then chop fine; add a little butter, pepper and salt; press the whole very closely into an earthenware mold, and bake one hour, either in an oven or in front of the fire.

Cold Slaw.—Sprinkle a quart of finely chopped cabbage with salt, and let it stand an hour; drain off the brine into a saucepan; pour half a pint of strong vinegar, a piece of butter (size of a hickory nut), a teaspoonful of strong mustard (after it has been stirred with water), and half the same of pepper; when it boils stir in two well-beaten eggs, and three tablespoonfuls of sweet cream; pour hot on the cabbage, and have it cold when it is to be served. A very delicious relish with meats.

Onions.—If milk is plenty, use equal quantities of skim-milk and water, allowing a quart of each for a dozen or so large onions. If water alone is used, change it after the first half-hour, as this prevents their turning dark; salting as for all vegetables, and boiling young onions one hour; old ones, two. Either chop fine, and add a spoonful of butter, half a teaspoonful of salt, and a little pepper, or serve them whole in a dressing made by heating one cupful of milk with the same butter and other seasoning as when chopped. Put the onions in a hot dish, pour this over them, and serve. They may also be half-

boiled; then put in a buttered dish, covered with this sauce and a layer or bread crumbs, and baked for an hour.

STRING BEANS.—String, cut in bits, and boil an hour if very young. If old, an hour and a half, or even two, may be needed. Drain off the water, and season like green peas.

SHELLED BEANS.—Any green bean may be used in this way, Lima and butter beans being the nicest. Put on in boiling, salted water, and boil not less than one hour. Season like string beans.

GREEN CORN.—Husk, and pick off the silk. Boil in well-salted water, and serve on the cob, wrapped in a napkin, or cut off and seasoned like beans. Cutting down through each row gives, when scraped off, the kernel without the hull.

GREEN CORN FRITTERS.—One pint of green corn grated. This will require about six ears. Mix with this half a cupful of milk, two well-beaten eggs, half a cupful of flour, one teaspoonful of salt, half a teaspoonful of pepper, and a tablespoonful of melted butter. Fry in very small cakes in a little hot butter, browning well on both sides. Serve very hot.

CORN PUDDING.—One pint of cut or grated corn, one pint of milk, two well-beaten eggs, one teaspoonful of salt and a saltspoonful of pepper. Butter a pudding dish, and bake the mixture half an hour. Canned corn can be used in the same way.

SPINACH.—Not less than a peck is needed for a dinner for three or four. Pick over carefully, wash, and let it lie in cold water an hour or two. Put on in boiling, salted water, and boil an hour, until tender. Take up in a colander, that it may drain perfectly. Have in a hot dish a piece butter the size of an egg, half a teaspoonful of vinegar. Chop the spinach fine, and put in the dish, stirring in this dressing thoroughly. A teacupful of cream is often added. Any tender greens, beet or turnip tops, kale, etc., are treated in this way; kale, however, requiring two hours boiling.

ARTICHOKES.—Cut off the outside leaves; trim the bottom; throw into boiling, salted water, with a teaspoonful of vinegar in it, and boil an hour. Season, and serve like turnips, or with drawn butter poured over them.

Tomatoes Stewed.—Pour on boiling water, to take off the skins; cut in pieces, and stew slowly for half and hour; adding for a dozen tomatoes a tablespoonful of butter, a teaspoonful of salt, a saltspoonful of pepper, and a teaspoonful of sugar. Where they are preferred sweet, two tablespoonfuls of sugar will be necessary. They may be thickened with a tablespoonful of flour or corn-starch dissolved in a little cold water, or with half a cupful of rolled cracker or bread crumbs. Canned tomatoes are stewed in the same way.

Bread-Making and Flour.—Much of the health, and consequently much of the happiness, of the family depends upon good bread; therefore, no pains should be spared in learning the best method of making, which will prove easiest in the end.

Yeast, flour, kneading, and baking must each be perfect, and nothing in the whole range of cooking is of such prime importance.

Once master the problem of yeast, and the first form of wheat bread, and endless varieties of both bread and breakfast cakes can be made.

The old and the new process flour—the former being known as the St. Louis, and the latter as Haxall flour—are now to be had at all good grocers; and from either good bread may be made, though that from the latter keeps moist longer. Potapsco flour is of the same quality as the St. Louis. It contains more starch than the St. Louis, and for this reason requires, even more than that, the use in the family of coarser, or graham flour, at the same time; white bread alone not being as nutritious or strengthening.

Flour made by the new process swells more than that by the old, and a little less quantity—about an eighth less—is therefore required in mixing and kneading. As definite rules as possible are given for the whole operation; but experience alone can insure perfect bread, changes of temperature affecting it once, and baking being also a critical point.

Pans made of thick tin, or, better still, of Russia iron, ten inches long, four or five wide, and four deep, make the best shaped loaf, and one requiring a reasonably short time to bake.

Yeast.—Ingredients: One teacupful of lightly broken

hops; one pint of sifted flour; one cupful of sugar; one tablespoonful of salt; four large or medium-sized potatoes; and two quarts of boiling water.

Boil the potatoes and mash them fine. At the same time, having tied the hops in a little bag, boil them for half an hour in two quarts of water, but in another saucepan. Mix the flour, sugar, and salt well together in a large mixing-bowl, and pour on the boiling hop-water, stirring constantly. Now add enough of this to the mashed potato to thin it till it can be poured, and mix all together, straining it through a sieve to avoid any possible lumps. Add to this, when cool, either a cupful of yeast left from the last, or of baker's yeast, or a Twin Brothers' yeast cake, dissolved in a little warm water. Let it stand till partly light, and then stir down two or three times in the course of five or six hours, as this makes it stronger. At the end of that time it will be light. Keep in a covered stone jar, or in glass cans. By stirring in corn meal till a dough is made, and then forming it in small cakes and drying in the sun, dry yeast is made, which keeps better than the liquid in hot weather. Crumb, and soak in warm water half an hour before using.

Potato yeast is made by omitting hops and flour, but mashing the potatoes fine with the same proportion of other ingredients, and adding the old yeast, when cool, as before. It is very nice, but must be made fresh every week; while the other, kept in a cool place, will be good a month.

Bread.—For four loaves of bread of the pan-size given above, allow as follows: Four quarts of flour; one large cupful of yeast; one tablespoonful of salt, one of sugar, and one of butter or lard; one pint of milk mixed with one of warm water, or one quart of water alone for the "wetting."

Sift the flour into a large pan or bowl. Put the sugar, salt, and butter in the bottom of the bread pan or bowl, and pour on a spoonful or two of boiling water, enough to dissolve all. Add the quart of wetting and the yeast. Now stir in slowly two quarts of the flour; cover with a cloth, and set in a temperature of about 75 degrees to rise until morning. Bread mixed at nine in the evening will be ready to mold into loaves or rolls by six the next morning. In summer it would be neces-

sary to find a cool place; in winter a warm one—the chief point being to keep the temperature even. If mixed early in the morning, it is ready to mold and bake in the afternoon, from seven to eight hours being all that it should stand.

The first mixture is called a sponge; and, if only a loaf of graham or rye bread is wanted, one quart of it can be measured and thickened with other flour, as in the rules given hereafter.

To finish as wheat bread, stir in enough flour from the two quarts remaining to make a dough. Flour the moulding-board very thickly, and turn out. Now begin kneading, flouring the hands, but after the dough is gathered into a smooth lump, using as little flour as may be. Knead with the palm of the hand as much as possible. The dough quickly becomes a flat cake. Fold it over, and keep on kneading not less than twenty minutes; half an hour being better.

Make into loaves; put into the pans; set them in a warm place, and let them rise from thirty to forty-five minutes, or till they have become nearly double in size. Bake in an oven hot enough to brown a teaspoonful of flour in one minute; spreading the flour on a bit of broken plate, that it may have an even heat. Loaves of this size will bake in from forty-five to sixty minutes. Then take them from the pans; wrap in thick cloths kept for the purpose, and stand them tilted up against the pans till cold. Never lay hot bread on a pine table, as it will sweat, and absorb the pitchy odor and taste; but tilt so that air may pass around it freely. Keep well covered in a tin box, or large stone pot, which should be wiped out every day or two, and scalded and dried thoroughly now and then. Pans for wheat bread should be greased very lightly; for graham or rye, much more, as the dough sticks and clings.

Instead of mixing a sponge, all the flour may be molded in and kneaded at once, and the dough set to rise in the same way. When light, turn out. Use as little flour as possible, and knead for fifteen minutes; less time being required, as part of the kneading has already been done.

Graham Bread.—One quart of wheat sponge; one even quart of graham flour; half a teacupful of brown sugar or molases; half a teaspoonful of soda dissolved in a little hot water; and half a teaspoonful of salt.

Pour the sponge in a deep bowl; stir in the molasses, etc., and lastly the flour, which must never be sifted. The mixture should be so stiff that the spoon moves with difficulty. Bake in two loaves for an hour or an hour and a quarter, graham requiring longer baking than wheat.

If no sponge can be spared, make as follows: One pint of milk or water; half a cupful of sugar or molasses; half a cupful of yeast; one teaspoonful of salt; one cupful of wheat flour; two cupfuls of graham. Warm the milk or water; add the yeast and other ingredients, and then the flour; and set in a cool place—about 60 degrees Fahrenheit—over night, graham bread souring more easily than wheat. Early in the morning stir well; put into two deep, well-greased pans; let it rise an hour in a warm place and bake one hour.

Old School Presbyterian Yeast.—Boil two good handfuls of good hops in three quarts of water. Strain. When cool stir in one quart of flour, one cupful of sugar, and a handful of salt. Cover this in a stone jar, and let it stand three days in a warm place, stirring it occasionally. On the fourth day add one quart of nicely mashed potatoes. Let it stand until the day following, when it will be ready for use. A small teacupful is sufficient for five loaves of bread.

This yeast, which has proved most reliable, needs nothing to start it, as it is self-raising, and, if kept in a cool place, will keep six weeks in the summer, and three months in cold weather.

It does not foam as do other kinds of yeast, so that one who had not used it would think it worthless, but if once used its excellency will not be doubted.

In making bread, a tablespoonful of white sugar to a quart of flour is a great improvement to all kinds of bread.

Hop Yeast.—Of pressed hops, break up fine about enough to make a teacupful; boil them in one quart of water for half an hour. At the same time boil in another kettle ten or twelve potatoes (peeled) in a quart of water; when thoroughly done mash the potatoes and pour the water back over them. If the water is boiled away, restore the quantity. Have ready two quarts of sifted flour; strain the hop water on to it, and add the potato gruel; when lukewarm put in a teacupful of good yeast,

or a yeast cake, and a little salt. After it is thoroughly light it should be kept in a stone jug or jar in a cool place.

Brown Bread.—One quart of corn meal, one pint of rye or graham flour, one quart of sour milk, one teacupful of molasses, and one teaspoonful of soda. Steam four hours, or bake one hour. This quantity will make two loaves.

Corn Bread.—One quart of Indian meal, two ounces of butter, as much warm milk as will make a stiff batter, four eggs, a little salt. Beat the whole well together, and bake in shallow tins in a moderate oven.

To Make Twist Bread.—Let the bread be made as directed for baker's or for wheat bread, then take three pieces as large as a pint bowl each; strew a little flour over the pasteboard or table, roll each piece under your hands, to twelve inches length, making it smaller in circumference at the ends than in the middle; having rolled the three in this way, take a baking tin, lay one part on it, join one end of each of the other two to it, and braid them together the length of the rolls, and join the ends by pressing them together; dip a brush in milk, and pass over the top of loaf; after ten minutes or so, set it in a quick oven, and bake for nearly an hour.

Wheat and Indian Bread.—Put three pints of water over the fire; when it is boiling hot, add a large tablespoonful of salt, stir into it sweet white corn meal, until it is a thick batter; continue to stir it for ten minutes, that it may not burn, then turn it into a dish, stir into it a quart of cold water; when it is cool enough to bear your hand in it, pour it into a bowl, in which is seven pounds of wheat flour, heaped around the sides so as to leave a hollow in the centre; add to it a gill of baker's yeast, and half a teaspoonful of saleratus, dissolved in a little hot water, then work the whole into a smooth dough, work it, or knead, for nearly an hour, then strew a little flour over it, lay a thickly folded cloth over, and set it in a warm place for five or six hours in summer, or mix at night in winter; when light, work it down, set it to rise again for one hour, then heat the oven, work the bread down, and divide it in loaves, and bake, according to their size, in a quick oven; when taken from the oven, turn them over in the pans, and set them to become cold;

if the crust is hard, wrap them in a towel as soon as taken from the oven.

Rye Bread.—Make the same as wheat and Indian bread, substituting rye flour for wheat. Or, thus: To a quart of warm water stir as much wheat flour as will make a smooth batter, stir into it half a gill of baker's yeast, and set it in a warm place to rise; this is called setting a sponge; let it be mixed in some vessel which will contain twice the quantity; in the morning put three pounds and a half of rye flour into a bowl or tray; make a hollow in the centre, pour in the sponge, add a dessert spoonful of salt, and half a small teaspoonful of saleratus, dissolved in a little water; make the whole into a smooth dough with as much warm water as may be necessary; knead it well, cover it, and let it set in a warm place for three hours, then knead it again, and make it in two or three loaves; bake in a quick oven one hour, if made in two loaves, and less if the loaves are smaller.

Bread-Cake or Biscuit.—Take from risen bread dough, the size of a small loaf, work into it one egg and a large tablespoonful of lard when it is thoroughly amalgamated, flour the hands and make it in balls the size and shape of a hen's egg; rub a tin pan over with a bit of sponge dipped in butter, lay them in so as to touch each other until the pan is full, wet the tops over with milk, then set them into a quick oven for twenty minutes; serve hot for breakfast or tea. When eaten, break them open—to cut them would make them heavy.

These cakes are very nice, when cold, for breakfast or tea.

Indian Griddle Cakes.—Beat two eggs light, stir them into a quart of sweet milk with a teaspoonful of salt and enough corn meal to make a good batter; bake as soon as mixed, on a hot griddle rubbed over with a bit of suet or fat pork; a tablespoonful of butter for each cake.

Johnny Cake.—Put a quart of fresh corn meal into a basin, add a heaping teaspoonful of salt, stir into it boiling water until it is all moistened, then with your hands make it in cakes half an inch thick, and bake them on a hot griddle rubbed over with a bit of pork fat or beef suet; let them do slowly; when one side is done turn the other; they may be baked in an

oven for twenty minutes; or, put the cake on a flat board or iron plate, and slant it in front of the fire; when one side is done, turn the other; serve hot, split them open and butter freely; they are eaten with fried pork.

INDIAN MEAL MUFFINS.—Pour boiling water into a quart of yellow corn meal, stirring it all the time until it is a thick batter; let it cool; when only warm, add a small teacupful of butter, a teaspoonful of salt, and a tablespoonful of yeast, with two well-beaten eggs; set it in a warm place for two hours, then stir it smooth, and bake in small cakes on a hot griddle; when one side is a rich brown, turn the other, lay them singly on a hot dish, and serve. These may be made without the yeast, and baked as soon as mixed.

BUCKWHEAT GRIDDLE CAKES.—Put three pints of warm water into a stone pot or jar, add a gill of baker's yeast, or an inch square of turnpike cake dissolved in a little warm water; add a heaping teaspoonful of salt, and half a small teaspoonful of saleratus, have a pudding stick, or spatula, and gradually stir in enough buckwheat flour to make a nice batter, beat it perfectly smooth, then cover it and set it in a moderately warm place until morning; a large handful of corn meal may be put with the flour, and it is by many persons considered an improvement.

TO BAKE BUCKWHEAT CAKES.—Set a griddle over a gentle, steady fire; when it is hot, rub it over with a bit of suet or fat fresh pork on a fork; the griddle must be hot but not scorching; put the batter on in small cakes; when one side is nicely browned and about half cooked through, turn them.

These cakes, to be in perfection, must be not much thicker than a dollar piece, and both sides a delicate brown. Should the batter prove too thick, it may be made thinner with sweet milk; this will also make them bake a finer color. The best of sweet butter and syrup to be served with buckwheat cakes hot from the griddle. Should the cakes be preferred thicker than mentioned in this recipe, it is an easy matter to make them so; take care that they are baked through.

Buckwheat may be mixed the same as wheat muffins, and baked on a griddle.

MUFFINS.—Mix with a pint of warm milk two well beaten eggs, half a teaspoonful of melted butter, and half a gill of baker's yeast, with a teaspoonful of salt and a bit of saleratus the size of a large pea (dissolved in hot water); stir in enough sifted wheat flour to make a thick batter, set it in a warm place to rise, for three hours in warm weather, or longer in winter; it may be mixed at night for breakfast next morning; put a griddle over the fire; when it is hot, rub it over with some fat, grease the inside of the rings, set them on and half fill them with the batter, or they may be done without rings; when one side is done, turn the other; bake a light color; as they are done break each one open, put a bit of butter in each, and set them in front of the fire until served; muffins should never be cut open. Cold muffins may be toasted and served hot.

TEA RUSK.—To a pint of warm milk put half a gill of baker's yeast, a teaspoonful of salt, and half a small teaspoonful of saleratus, dissolved in a little hot water; put to it enough wheat flour to make a soft dough; mix well and smooth; cover it, and set it in a warm place for two hours, to rise; when light, add half a teacupful of sugar, and a cupful of melted butter; work them well into the dough, flour your hands well, and make it in small cakes (the size of a large egg, or a trifle larger), lay them close together in a buttered pan; dip your hand in a little sweetened milk, and pass it lightly over the tops of the rusks, set them in a quick oven for half an hour; serve hot.

COMMON BUNS.—Rub four ounces of butter into two pounds of flour, with four ounces of fine sugar and a teaspoonful of carraway seeds, and the same of salt; add half a gill of yeast, and as much warm milk as will make a soft dough; set it in a warm place to rise (it will be light after about three hours); strew a paste-slab and rolling pin with flour, and roll out the dough to half an inch thickness, and cut them in large, round cakes; lay them on baking tins, wet the tops over with milk, strew sugar over each, and put them on tins in a quick oven for fifteen minutes.

MILK BISCUITS.—Warm two ounces of sweet butter in a gill of sweet milk, and with it wet a pound of flour into a very

stiff paste; beat it with a rolling-pin, and work it very smooth; roll it a quarter of an inch thick; cut it in small, round cakes; stick each with a fork, and bake ten minutes in a quick oven.

To Fry Doughnuts and Crullers.—Have a small iron or porcelain kettle; put into it a pound of lard, set it over a gentle fire; when it is boiling hot, drop a bit of dough in to try it; if the fat is not hot enough, the cakes will absorb it, and thereby be rendered unfit for eating; if too hot, it will make them a dark brown outside before the inside is cooked; boiling hot is about the heat the fat should be; if it is at a right heat, the doughnuts will in about ten minutes be of a delicate brown outside, and nicely cooked inside; five or six minutes will cook a cruller; try the fat, by dropping a bit of the dough in; if it is right, the fat will boil up when it is put in; keep the kettle in motion all the time the cakes are in, that they may boil evenly; when the cakes are a fine color take them out with a skimmer on to an inverted sieve.

Doughnuts.—Take a pound of flour, a quarter of a pound of butter, three-quarters of a pound of clean brown sugar rolled fine, one nutmeg, grated, and a tablespoonful of ground cinnamon; mix these well together; then add a tablespoonful of baker's yeast, with as much warm milk, with saleratus the size of a pea dissolved in it, as will make a smooth dough; knead it for a few minutes, cover it, and set it in a warm place to rise for three hours or more, until it is light; then roll it out to a quarter of an inch in thickness; cut it in small squares or diamonds, and fry as directed.

Indian Muffins.—One quart of milk, eight eggs, one and a half cupfuls of butter, one cupful of flour, two cupfuls of Indian meal, one teaspoonful of soda, two teaspoonfuls of cream of tartar, and a little salt; two teaspoonfuls of sugar. Beat well together and bake in muffin rings.

(This recipe is from a reliable source, but we can only recommend it to those who have eggs and butter in abundance.)

Rice Muffins.—Two cups of milk, four tablespoonfuls of yeast, one tablespoonful of white sugar, two tablespoonfuls of melted butter, nearly a cupful of well boiled rice, four cup-

fuls of flour, or enough to make a good batter; salt to the taste; one-quarter teaspoonful of soda, dissolved in hot water, added just before baking. Beat the ingredients well together, set to rise for six hours, or until very light; put into muffin rings, let it stand fifteen minutes, and bake quickly; eat hot.

FLANNEL CAKES.—One cupful of sweet milk, one-half cupful of yeast, whites of two eggs, two-thirds of a cupful of butter, flour, enough to make a thick batter; set to rise over night and in the morning add whites and butter. Bake in cups.

PANCAKES.—Add enough flour to one quart of sour milk to make a rather thick batter. Let it stand over night and in the morning add two well beaten eggs, salt, and half a teaspoonful of soda dissolved in one tablespoonful of warm water. Bake immediately.

RICE PANCAKES.—One and a half pints of boiled rice, the same of flour, one-half teacupful of sour milk, one teacupful of sweet milk, one teaspoonful of soda, salt, three eggs, and butter the size of a walnut.

Salads.—CHICKEN SALAD.—Mix the celery and chicken together, and then stir well into them a mixture in the proportion of three tablespoonfuls of vinegar to one of oil and one (level) of salt, a pinch—the smallest pinch—of cayenne, about what would lie on the point of a penknife, and a teaspoonful of mustard. Let the chicken stand in this mixture an hour or two; drain off what may be in the bottom of the bowl; ten or twenty minutes before serving pour over a mild mayonnaise. Little strips of anchovy rolled up are used with pickles, hard boiled eggs, and lettuce heads, or tender yellow celery tops to garnish.

As minute directions as possible are given for the various methods and tastes in mixing the dressing.

An eight-pound turkey, rubbed with a fresh lemon, and boiled in well salted water (having two tablespoonfuls of raw rice in it), is used and preferred by many to a pair of chickens. The flavor is radically different, but quite delightful. Every one of the recipes given will make a nice salad, unless our scholars fall into the error of a well-meaning lady, who set her dish of salad into the hot oven for half an hour. The

colder your salad is the crisper and fresher it will taste, and the thicker and better will be your dressing.

Chicken Salad.—One chicken, three bunches of celery, four eggs (whites and yolks beaten seperately), one or two tablespoonfuls of mixed mustard, two teaspoonfuls of salt, one level teaspoonful of pepper, one tablespoonful of butter (hard), six or eight tablespoonfuls of vinegar. Set the dish with these ingredients into a pan of boiling water on the stove, and stir until it thickens like custard; then set off to cool. Cut the chicken that has been carefully boiled into little pieces, and the celery also, and pour over them the dressing, adding, if you please, a little olive oil and sweet cream.

Dressing for Salad.—Four eggs beat light, yolks and whites together; two tablespoonfuls of mixed mustard, one teaspoonful of salt, one teaspoonful of black pepper, or one-third of a teaspoonful of red pepper, one tablespoonful of butter, and nearly one teacupful of sharp vinegar. Float the pan containing the ingredients in a pan of boiling water on the stove and stir until thick like custard. When cold pour over the salad, adding cold vinegar if needed.

Pies.—Pastry.—One pound and a quarter of flour, one pound of shortening and a little salt, all put together, sufficient cold water to mix with; no more flour. Put upon the molding-board, roll out and cut in strips, put one upon another, then cut off in squares, roll out, and put upon plates.

Plain Pie-Crust.—One pound of flour, half a pound of butter; mix thoroughly with a knife or a spoon. Pour in very cold water, just enough to form a dough for rolling out; flour the board and rolling-pin, using a knife to handle the dough (the warmth of the hand makes it heavy); roll out the size of one plate at a time, so as to work it as little as possible. Bake in a quick oven.

Tart Crust.—The white of one egg beaten to a stiff froth, one tablespoonful of white sugar, one cupful of lard, a little salt, five tablespoonfuls of water, three cupfuls of sifted flour; roll quite thin for tarts; cut out with a cooky cutter—a scalloped one will look best; take an open-top thimble, make five holes in one, lay on a whole one, which makes one tart; pro-

ceed with all the dough in the same way; bake lightly; when done split open the tart and lay a slice of nice jelly between the layers; squeeze up the jelly through the holes; place them on the table on a plate, and you have a splendid looking dish for the tea table, and something that will keep two months. Do not put your jelly in till you wish them for the table.

Rich Mince Pie.—Three pounds of beef, one beef's tongue, four (or six) pounds of suet, three and a half pounds of raisins, three pounds of currants, three-quarters of a pound of citron, eight pounds of chopped apples, four and a half pounds of sugar, three pints of molasses, three ounces of cinnamon, two ounces of cloves, a nutmeg, one teacupful of the Mace Compound, one and a fourth ounces of salt, half an ounce of pepper, one gallon and a half of sweet cider. When mixed, put into a kettle and scald, stirring it all the time. Put it hot into Hero or Mason jars—and the longer you keep it the nicer it will be.

Grandmother's Apple Pie.—Line a deep pie-plate with plain paste. Pare sour apples—greenings are best; quarter, and cut in thin slices. Allow one cup of sugar, and quarter of a grated nutmeg mixed with it; fill the pie-plate heaping full of the sliced apple, sprinkling the sugar between the layers. It will require not less than six good sized apples. Wet the edges of the pie with cold water; lay on the cover, and press down securely, that no juice may escape. Bake three-quarters of an hour, or a little less, if the apples are very tender. No pie in which the apples are stewed beforehand can compare with this in flavor. If they are used, stew till tender, and strain; sweeten and flavor to taste; fill the pies, and bake half an hour.

Dried-Apple Pies.—Wash one pint of dried apples, and put in a porcelain kettle with two quarts of warm water; let them stand all night. In the morning put on the fire, and stew slowly for an hour; then add one pint of sugar, a teaspoonful of dried lemon or orange rind, or half a fresh lemon sliced, and half a teaspoonful of cinnamon. Stew half an hour longer, and then use for filling the pies. The apple can be strained if preferred, and a teaspoonful of butter added. This

quantity will make two pies. Dried peaches are treated in the same way.

Lemon Pies.—Three lemons, juice of all and the grated rind of two; two cupfuls of sugar, three cupfuls of boiling water, three tablespoonfuls of corn starch dissolved in a little cold water, three eggs, a piece of butter the size of an egg.

Pour the boiling water on the dissolved corn starch, and boil for five minutes. Add the sugar and butter, the yolks of the eggs beaten to a froth, and last the lemon juice and rind. Line the plates with crust, putting a narrow rim of it around each one; pour in the filling, and bake half an hour. Beat the whites to a stiff broth; add half a teacupful of powdered sugar and ten drops of lemon extract, and, when the pie is baked, spread this on. The heat will cook it sufficiently, but it can be browned a moment in the oven. If to be kept a day, do not make the frosting till just before using. The whites will keep in a cold place. Orange pie can be made in the same way.

Sweet-Potato Pie or Pudding.—One pound of hot, boiled sweet pototo rubbed through a sieve; one cupful of butter, one heaping cupful of sugar, half a grated nutmeg, one glass of brandy, a pinch of salt, and six eggs.

Add the sugar, spice, and butter to the hot potato. Beat whites and yolks seperately, and add, and last the brandy. Line deep plates with nice paste, making a rim of puff paste. Fill with the mixture, and bake till the crust is done, about half an hour. Wickedly rich, but very delicious. Irish potatoes can be treated in the same way, and are more delicate.

Squash or Pumpkin Pie.—Prepare and steam. Strain through a sieve. To a quart of the strained squash add one quart of new milk, with a spoonful or two of cream, if possible; one heaping cupful of sugar, into which has been stirred a teaspoonful of salt, a heaping one of ginger, and half a one of cinnamon. Mix this with the squash, and add from two to four well beaten eggs. Bake in deep plates lined with plain pie-crust. They are done when a knife-blade, on being run into the middle, comes out clean. About forty minutes will be enough. For pumpkin pie half a cupful of molasses may be added, and the eggs can be omitted, sub-

stituting half a cupful of flour mixed with the sugar and spice before stirring in. A teaspoonful of butter can always be added.

CHERRY AND BERRY PIES.—Have a very deep plate, and either no crust under, save a rim, or a very thin one. Allow a cupful of sugar to a quart of fruit, but no spices. Stone cherries. Prick the upper crust half a dozen times with a fork, to let out the steam.

For rhubarb or pie-plant pies, peel the stalks; cut them in little bits, and fill the pie. Bake with an upper crust.

CUSTARD PIE.—Line and rim deep plates with pastry, a thin custard pie being very poor. Beat together a teacupful of sugar, four eggs, and a pinch of salt, and mix slowly with one quart of milk. Fill the plate up to the pastry rim after it is in the oven, and bake till the custard is firm, trying, as for squash pies, with a knife blade.

COCOANUT PIE.—One teacupful of sugar, one-half cupful of butter, three eggs, one grated cocoanut, one pint of scalded milk poured on the cocoanut, underlined with pastry.

ORANGE PIE.—Rub the yellow of two oranges with lumps of sugar, add juice of three, and one cupful of white sugar, one finely rolled cracker, a small piece of butter, four eggs, one cupful of sweet milk. Line pudding dish with paste, and bake until firm; nice either hot or cold. With or without a meringue.

PIE-PLANT PIE.—Peel a bunch of pie-plant, put it into your chopping-bowl and chop into pieces the size of your little finger nail; grate the rind and squeeze the juice of a lemon over this; add sugar.

STRAWBERRY PIE.—Make a nice puff paste, with which line a baking plate; half bake in a quick oven. Have ready sugared strawberries to fill the plate, and the white of an egg beaten and sweetened as a meringue with which to cover the berries. Return to the oven long enough to brown slightly.

PUMPKIN PIE.—One pint of well stewed and strained pumpkin, one good quart of scalding hot, rich milk, and one and one-half cupfuls of sugar, four eggs, one-half teaspoonful of salt,

one tablespoonful of ginger, and one of ground cinnamon. Bake in pie-plates lined with good paste; do not let the mixture stand after it is put together, but bake at once.

Puddings.—For boiled puddings a regular pudding-boiler, holding from three pints to two quarts, is best, a tin pail with a very tight-fitting cover answering instead, though not as good. For large dumplings a thick pudding-cloth—the best being of Canton flannel, used with the nap-side out—should be dipped in hot water, and wrung out, dredged evenly and thickly with flour, and laid over a large bowl. From half to three-quarters of a yard square is a good size. In filling this, pile the fruit or berries on the rolled-out crust which has been laid in the middle of the cloth, and gather the edges of the paste evenly over it. Then gather the cloth up, leaving room for the dumpling to swell, and tying very tightly. In turning out, lift to a dish; press all the water from the ends of the cloth; untie and turn away from the pudding, and lay a hot dish upon it, turning over the pudding into it, and serving at once, as it darkens or falls by standing.

In using a boiler, butter well, and fill only two-thirds full that the mixture may have room to swell. Set it in boiling water, and see that it is kept at the same height, about an inch from the top. Cover the outer kettle, that the steam may be kept in. Small dumplings, with a single apple or peach in each, can be cooked in a steamer. Puddings are not only much more wholesome, but less expensive than pies.

Apple Dumplings.—Make a crust, as for biscuit, or a potato-crust, as follows: Three large potatoes, boiled and mashed while hot. Add to them two cupfuls of sifted flour and one teaspoonful of salt, and mix thoroughly. Now chop or cut into it one small cupful of butter, and mix into a paste with about a teacupful of cold water. Dredge the board thick with flour, and roll out, thick in the middle, and thin at the edges. Fill, as directed, with apples pared and quartered, eight or ten good-sized ones being enough for this amount of crust. Boil for three hours. Turn out as directed, and eat with butter and syrup or with made sauce. Peaches pared and halved, or canned ones drained from the syrup, can be used. In this

case, prepare the syrup for sauce. Blueberries are excellent in the same way.

English Plum Pudding.—One pound of raisins stoned and cut in two; one pound of currants washed and dried; one pound of beef-suet chopped very fine; one pound of bread-crumbs; one pound of flour; half a pound of brown sugar; eight eggs; one pint of sweet milk; one teaspoonful of salt; a tablespoonful of cinnamon; two grated nutmegs; a glass each of wine and brandy.

Prepare the fruit and dredge thickly with flour. Soak the bread in the milk; beat the eggs and add. Stir in the rest of the flour, the suet, and last the fruit. Boil six hours either in cloth or large mold. Half the amounts given make a good-sized pudding; but, as it will keep three months, it might be boiled in two molds. Serve with a rich sauce.

Any-Day Plum Pudding.—One cup of sweet milk; one cup of molasses; one cup each of raisins and currants; one teaspoonful of salt, and one of soda, sifted with three cups of flour; one teaspoonful each of cinnamon and allspice.

Mix milk, molasses, suet, and spice; add flour and then the fruit. Put in a buttered mold and boil three hours. Eat with hard or liquid sauce. A cupful each of prunes and dates or figs can be substituted for the fruit, and is very nice; and the same amount of dried apples, measured after soaking and chopping, is also good. Or the fruit can be omitted altogether, in which case it becomes "Troy Pudding."

Batter Pudding, Boiled or Baked.—Two cups of flour in which is sifted a heaping teaspoonful of baking powder, two cups of sweet milk, four eggs, one teaspoonful of salt. Stir the flour gradually into the milk, and beat hard for five minutes. Beat yolks and whites separately, and add to batter. Have the pudding-boiler buttered. Pour in the batter, and boil steadily for two hours. It may also be baked an hour in a buttered pudding-dish. Serve at once, when done, with a liquid sauce.

Tapioca Pudding.—Put into one quart of milk two-thirds of a cupful of tapioca that has soaked over night, one saltspoonful of salt; set it on the back part of the stove and heat gently

until the tapioca becomes clear; then beat the yolks of four eggs with one cupful of sugar and the rind and juice of one lemon; stir this into the boiling milk and tapioca; of the whites of the eggs make a frosting with one cupful of pulverized sugar. Add the juice of a lemon, or other flavoring, spread over the top of the pudding in a baking dish, and let it just brown to a cream tint in the oven. It is best eaten cold.

Cheap Apple Pudding.—In the first place select two deep earthen dishes, of the same size and shape, that will hold two or three quarts, according to the family. Then fill one with nice apples, peeled and sliced thin. Add a teacupful of cold water. Cover the apples with a tender crust, then turn the empty dish, after it has been well buttered, over the one in which you have the pudding, and place them both in a hot oven. It will require about half an hour to bake. Let the pudding be just ready for the dessert, and do not remove the upper dish until the minute the pudding is to be eaten.

It is nice with sugar and butter, but with rich cream, sweetened, it is a very delicious dessert.

Rice Pudding.—Half a teacupful of rice in three pints of milk; set it in a tin pail in a kettle of boiling water; let it simmer till the rice is cooked soft; while hot, stir in two tablespoonfuls of butter; set it by to cool; beat five eggs, leaving out two whites, and a teacupful of sugar; stir into the rice and milk when cold, and set in the oven to bake; take out as soon as it forms a custard; do not wait for the custard to set or it will whey; one-quarter of a pound of stoned raisins added to this is very nice. Make a meringue of the two whites of eggs and six tablespoonfuls of pulverized sugar beaten to a stiff froth; pile up on the top and set in the oven just two minutes.

Ginger Pudding.—Five eggs, two teacupfuls sugar, one and one-half teacupfuls butter, four teacupfuls of flour, after being sifted, one of molasses, one of sour milk, with a teaspoonful of soda dissolved in it, two teaspoonfuls ground ginger, a little cinnamon, a pinch of salt, unless the butter is salt enough; beat the eggs and sugar together, set the molasses and butter over the fire to melt the latter; mix alternately the eggs and flour; lastly, milk, soda and spice; bake slowly. Eat with the following sauce: One-half pint of molasses, one pint of sugar,

lump of butter, size of an egg, a teaspoonful of ginger, a little water. Let all boil and serve hot.

COTTAGE PUDDING.—One egg, one pint of flour, one cupful of milk, one cupful of sugar, three tablespoonfuls of melted butter, one teaspoonful of soda, two teaspoonfuls of cream of tartar. Mix the cream of tartar in the flour, and the soda in the milk. Can be made in twenty minutes. Bake quickly, and eat with sauce. Square, shallow pans are better to bake in. Two teaspoonfuls of baking powder can be used.

MARROW PUDDING.—Grate a large loaf of baker's bread and pour on the crumbs a pint of rich milk boiling hot; when cold, add four eggs and three-quarters of a pound of beef's marrow sliced thin, four tablespoonfuls of lemon juice, in which one teaspoonful (level) of mace has been soaked and stirred, one teaspoonful of extract of nectarine, and one tablespoonful of rose water. Add two cups of raisins and one of blanched almonds, if you wish; boil three hours; or omit the fruit and use a pound of marrow instead of three-quarters, and bake it.

STEAMED GRAHAM BREAD.—One cupful of milk, three-quarters of a cupful of molasses, one cupful of water, two cupfuls of graham flour, three teaspoonfuls of baking powder, one half teaspoonful of soda dissolved in a little hot water, a little salt; steam three hours. Nice hot for a dessert with Virginia molasses sauce.

CARROT PUDDING.—One pound of grated carrots, three-quarters of a pound of chopped suet; one-half pound of raisins and currants, four tablespoonfuls of sugar, eight tablespoonfuls of flour, spices to suit the taste; boil four hours and bake twenty minutes. This is the recipe, but we question whether we would bake it the twenty minutes if it were nice without.

WHORTLEBERRY PUDDING.—One quart of flour, one heaping tablespoonful of baking powder, a little salt, and mix with cold water, having the dough softer than for soda biscuit; roll out the paste and pour upon it one quart of whortleberries, then cover the berries by securely lapping the paste as for dumplings. The water must be boiling, the pot ample and

well filled with the boiling water. Dip the pudding cloth in hot water, then flour it well; tie the pudding very closely in the cloth and let it boil steadily one hour.

Cakes.—Spice Cakes.—Two pounds of sifted flour, three-quarters of a pound of sugar, three-quarters of a pound of butter, one tablespoonful of ground spices, one teaspoonful of salt, and two tablespoonfuls of yeast; mix it to a nice dough with warm milk, cover it, and set in a warm place for three hours; then roll it thin; cut it in small cakes, and bake ten or twelve minutes in a quick oven. These may be fried as doughnuts.

Wine Cakes.—Mix eight ounces of flour with half a pound of finely powdered sugar, beat four ounces of butter with two tablespoonfuls of wine; then make the flour and sugar into a paste with it, and four eggs, beaten light; add caraway seeds, and roll the paste as thin as paper; cut the cakes with the top of a tumbler, brush the tops over with the beaten white of an egg, grate sugar over, and bake ten or twelve minutes in a quick oven; take them from the tins when cold.

Soft Gingerbread (*Molasses*).—Take half a pint of sour milk, half a pint of molasses, one teacupful of butter, or salted lard, or beef fat, one large teaspoonful of saleratus, dissolved in a little hot water, two well beaten eggs, half a nutmeg, grated, a teaspoonful of ground cinnamon, and a large spoonful of ground ginger; mix in sifted wheat flour until it is a thick batter which you can stir easily with a spoon; beat it well together for some time, then pour it in an inch deep in square tin pans, buttered; bake half an hour in a quick oven; to ascertain whether it is done, try as directed in introductory remarks.

Soft Gingerbread (*without eggs*).—Make as directed for soft gingerbread, omitting the eggs, and using two teaspoonfuls of saleratus instead of one; dissolve it in a teacupful of warm water.

Molasses Cup Cakes.—Two cups of molasses, one cupful butter, one cupful of milk, one teaspoonful of powdered saleratus dissolved in a little hot water, one teaspoonful of lemon extract, half a nutmeg, grated, and two well beaten eggs; stir in, by degrees, enough flour to make it as stiff as you can stir easily

with a spoon, beat it well until it is very light, rub a two-quart tin basin over with a bit of butter, line it with white paper, and put the cake in it; bake forty minutes in a quick oven; try if it is done, by running a broom splint in it at the thickest part; if it comes out clean it is done. This is a delicious cake.

Common Cup Cake.—One teacupful of butter, two of sugar, four of flour, four well beaten eggs, one cupful of sour milk, one teaspoonful of saleratus, dissolved in a little water one teaspoonful of lemon extract, or a wineglass of brandy, and half a nutmeg, grated; beat up the mixture well, butter two two-quart basins, line them with white paper, and divide the mixture between them; bake in a quick oven three-quarters of an hour.

Pound Cakes.—One pound and a half of flour, one pound of butter, one pound of fine white sugar, ten eggs, one gill of brandy, half a nutmeg grated, and a teaspoonful of vanilla or lemon extract, or orange flour water.

Beat the butter and sugar to a cream, beat the eggs to a high froth, then put all together, beat it until it is light and creamy, put it in basins lined with buttered paper, let the mixture be an inch and a half deep, and bake in a moderate oven for one hour, then try it; when done, turn it gently out, reverse the pan, and set the cake on the bottom until cold; let the paper remain until the cake is to be cut.

Sponge Cake.—One pound of sugar finely ground, half a pound of sifted flour, eight eggs, one teaspoonful of salt, one tablespoonful of rose brandy, or a teaspoonful of lemon extract.

Beat the yolks of the eggs, flour and sugar together, until it is smooth and light, beat the whites of the eggs to a high froth, then beat all together until well mixed; one teaspoonful of cream of tartar, and half a teaspoonful of soda sifted dry into the flour.

Butter a square tin pan, line it with paper, and put in the mixture more than an inch deep; bake in a moderate oven.

Loaf Cake.—One pound of butter beaten to a cream, two pounds of sugar rolled fine, three pounds of sifted wheat flour, six well beaten eggs, three teaspoonfuls of powdered saleratus

dissolved in a little hot water, one tablespoonful of ground cinnamon, and half a nutmeg grated; add one pound of currants, well washed and dried, one pound of raisins stoned and cut in two; work the whole together, divide it in three loaves, put them in buttered basins, and bake one hour in a moderate oven.

FRENCH TEA CAKE.—Beat ten eggs to a high froth, dissolve half a teaspoonful of volatile salts in a little hot water, let it stand to cool, then put it to the eggs and beat for ten minutes; add four ounces of powdered loaf sugar, and the same of sifted flour; beat them well together, line square tin pans with buttered paper, put in the cake mixture nearly an inch deep, and bake in a quick oven. When served, cut it in squares.

DROP CAKES.—Beat eight eggs very light with one pound of powdered sugar and twelve ounces of flour; flavor with lemon or rose, and half a nutmeg, grated; if the mixture is not beat enough the cakes will run into each other; make them in small, oblong cakes, on sheets of paper; grate sugar over each, bake in a moderate oven; when done, take them from the paper with a knife.

WEDDING CAKE.—One pound of flour, nine eggs, the whites and yolks beaten separately, one pound of butter beaten to a cream, one pound of sugar, one teacupful of molasses, nutmegs grated, or ground mace, one ounce, one teaspoonful of ground allspice, one teaspoonful of cinnamon and a gill of brandy; beat this mixture well.

Having picked, washed and dried three pounds of currants, and stoned, and cut in two, three pounds of raisins, strew half a pound of flour over them, mix it well through and stir them with a pound of citron cut in strips into the cake.

Line round tin pans with buttered paper, put the mixture in an inch and a half or two inches deep, and bake in a moderate oven an hour and a half or two hours. See directions for icing a cake.

PLUM CAKE.—Make a cake of two cupfuls of butter, two cupfuls of molasses, one cupful of sweet milk, two eggs well beaten, one teaspoonful of powdered saleratus, dissolved with a

little hot water, one teaspoonful of ground mace or nutmeg, one teaspoonful of ground allspice, a tablespoonful of cinnamon and a gill of brandy; stir in flour to make a batter as stiff as may be stirred easily with a spoon, beat it well until it is light, then add two pounds of raisins stoned, and cut in two, two pounds of currants, picked, washed and dried, and half a pound of citron, cut in slips. Bake in a quick oven.

This is fine, rich cake, easily made and not expensive.

Rich Bride Cake.—Take four pounds of sifted flour, four pounds of sweet fresh butter beaten to a cream, and two pounds of white powdered sugar; take six eggs for each pound of flour, an ounce of ground mace or nutmegs, and a tablespoonful of lemon extract or orange flower water.

Wash through several waters and pick clean from grit, four pounds of currants, and spread them on a folded cloth to dry; stone, and cut in two, four pounds of raisins, cut two pounds of citrons in slips, and chop or slice one pound of blanched almonds.

Beat the yolks of the eggs with the sugar to a smooth paste; beat the butter and flour together and add them to the yolks and sugar; then add the spice and half a pint of brandy, and the whites of the eggs beaten to a froth; stir all together for some time, strew half a pound of flour over the fruit; mix it through, then by degrees stir it into the cake.

Butter large tin basins, line them with white paper and put in the mixture two inches deep, and bake in a moderate oven two hours. The fruit should be prepared the day before making the cake.

To Make Icing for Cakes.—Beat the white of two small eggs to a high froth; then add to them quarter of a pound of white sugar ground fine like flour; flavor with lemon extract or vanilla; beat it until it is light and very white, but not quite so stiff as kiss mixture; the longer it is beaten the more firm it will become. No more sugar must be added to make it so. Beat the frosting until it may be spread smoothly on the cake.

This quantity will ice quite a large cake over the top and sides.

To Ice or Frost Cake.—Make an icing as above directed, more or less, as may be required.

Turn over the basin in which the cake was baked, and set the cake on the bottom, then spread the icing on the sides with a piece of card paper or Bristol board, about four inches long and two and a half wide, then heap what you suppose to be sufficient for the top in the centre of the cake, and with the card paper spread it evenly over, set it in a warm place to dry and harden, after which ornament it as you may fancy.

If sugar ornaments are put on, it should be done whilst it is moist or soft.

For small cakes, where a thin icing only is required, it must not be beaten as stiff. Let it be so as to flow for the last coating of a cake that it may be smooth.

ALMOND CAKE.—One-half cupful of butter, two of sugar, two and a half of flour, three-quarters of a cupful of sweet milk, one-half a teaspoonful of soda, one teaspoonful of cream of tartar, whites of eight eggs beaten to a stiff froth, one pound of soft-shelled almonds blanched by steeping in boiling water till the skins are loose enough to remove, and then sliced or rolled, adding, while crushing them, the juice of an orange; flavor with essence of bitter almond. Bake in a pan two inches deep.

COOKIES.—Two cupfuls of white sugar, one cupful of butter, three eggs, two teaspoonfuls of cream of tartar in the flour, one teaspoonful of soda, one tablespoonful of sweet milk; to the whole add flour enough to make it a soft mixture; add nutmeg.

SOFT COOKIES.—Take one cupful of butter and two of sugar; rub them to a cream; mix with them three well beaten eggs, one teacupful of milk or cream, six cupfuls of flour, one teaspoonful of saleratus, and a little nutmeg.

CURRANT SHORT CAKE.—String and sugar a quart of currants, take a quart of flour, mix well in it a large tablespoonful of butter and a tablespoonful of Snowflake baking powder, and a little salt; add milk enough to make a soft biscuit dough, roll it out three-quarters of an inch thick, and put it into dripping-pans eight by twelve inches, as this is a good size to cut. Bake, and the moment it is done turn out on to a platter, and with your carving knife open right through the center; spread

well with butter the top and bottom crust, then put in your currants, strawberries or raspberries, sprinkle some more sugar over, put on the top crust, and return to the oven for ten minutes to soak.

We consider sweet cream essential for eating with these short cakes, but many people do not mind its absence.

Strawberry short cake is made as above, except that you mash one-half the strawberries and leave the other half whole.

Freezing of Ice Cream and Ices.—With a patent freezer, ice cream and ices can be prepared with less trouble than puff paste. The essential points are the use of rock-salt, and pounding the ice into small bits. Set the freezer in the centre of the tub. Put a layer of ice three inches deep, then of salt, and so on till the tub is full, ending with ice. Put in the cream, and turn for ten minutes, or till you can not turn the beater. Then take off the cover, scrape down the sides, and beat like cake for at least five minutes. Pack the tub again, having let off all water; cover with a piece of old carpet. If molds are used, fill as soon as the cream is frozen; pack them full of it, and lay in ice and salt. When ready to turn out, dip in warm water a moment. Handle gently and serve at once.

Ice Cream of Cream.—To a gallon of sweet cream add two and a quarter pounds of sugar, and four tablespoonfuls of vanilla or other extract, as freezing destroys flavor. Freeze as directed.

Ice Cream with Eggs.—Boil two quarts of rich milk, and add to it, when boiling, four tablespoonfuls of corn starch wet with a cup of cold milk. Boil for ten minutes, stirring often. Beat twelve eggs to a creamy froth with a heaping quart of sugar, and stir in, taking it from the fire as soon as it boils. When cold, add three tablespoonfuls of vanilla or lemon, and two quarts either of cream or very rich milk, and freeze. For strawberry or raspberry cream, allow the juice of one quart of berries to a gallon of cream. For chocolate cream, grate half a pound of chocolate; melt it with one pint of sugar and a little water, and add to above rule.

Canning and Preserving.—In canning, see first that the jars are clean, the rubbers whole and in perfect order, and the

tops clean and ready to screw on. Fill the jars with hot (not boiling) water half an hour before using, and have them ready on a table sufficiently large to hold the preserving kettle, a dish-pan quarter full of hot water, and the cans. Have ready, also, a deep plate, large enough to hold two cans, a silver spoon, an earthen cup with handle, and, if possible, a can-filler—that is, a small tin in strainer shape, but without the bottom, and fitting about the top. The utmost speed is needed in filling and screwing down tops, and for this reason every thing must be ready beforehand.

In filling the can let the fruit come to the top; then run the spoon-handle down on all sides to let out the air; pour in juice till it runs over freely, and screw the top at once, using a towel to protect the hand. Set at once in a dish-pan of water, as this prevents the table being stained by juice, and also its hardening on the hot can. Proceed in this way till all are full; wipe them dry; and, when cold, give the tops an additional screw, as the glass contracts in cooling, and loosens them. Label them, and keep in a dark, cool closet. When the fruit is used, wash the jar, and dry carefully at the back of the stove. Wash the rubber also, and dry on a towel, putting it in the jar when dry, and screwing on the top. They are then ready for next year's use. Mason's cans are decidedly the best for general use.

General Rules for Canning.—For all small fruits allow one-third of a pound of sugar to a pound of fruit. Make it into syrup with a teacupful of water to each pound, and skim carefully. Throw in the fruit, and boil ten minutes, canning as directed. Raspberries and blackberries are best; huckleberries are excellent for pies, and easily canned. Pie-plant can be stewed till tender. It requires half a pound of sugar to a pound of fruit.

For peaches, gages, etc., allow the same amount of sugar as for raspberries. Pare peaches, and can whole, or in halves, as preferred. Prick plums and gages with a large darning-needle to prevent their bursting. In canning pears, pare and drop at once into cold water, as this prevents their turning dark.

Always use a porcelain-lined kettle, and stir either with a silver or a wooden spoon—never an iron one. Currants are

nice mixed with an equal weight of raspberries, and all fruit is more wholesome canned than in preserves.

MISCELLANEOUS RECIPES AND DIRECTIONS.

To Test the Purity of the Atmosphere.—Fill a glass tumbler with lime water, and place it in any convenient position. The rapidity with which a pellicle forms on its surface corresponds to the amount of carbonic acid, or foul air, present in the atmosphere that surrounds it.

To Clean Wall Papers.—Let the servant or man employed get on high steps, and first brush the wall all over with a perfectly clean brush. Then divide a stale loaf in large pieces and rub the paper downwards with it in firm, clear strokes; he must not go back over it with the same piece of bread, nor rub it up and down, only downwards. The bread will remove all the dirt and leave the paper like new; but it must not be used dirty, a fresh piece must be taken when the last used is soiled, otherwise dust will be carried from one breadth of the paper to the next.

To Remove Grease Spots.—If there are any grease spots on the paper, cover them with a little moist fuller's earth, and when it is dry brush it off. Repeat the application if required.

To Clean Paint.—Get some of the best whiting; powder it and then sift it, so that it may be as fine as possible. Put it in a plate for use. Get some clean, warm water in a basin, and a piece of soft flannel, and a new soft chamois leather.

Dip the flannel in the water and squeeze it nearly dry; then rub it down in the whiting, and take up as much as will adhere to it. Rub the paint gently with it and it will clean it perfectly. Next lightly wash the part done with clean water, and dry with the chamois leather. The paint will look as well as if it were just done, and the most delicate colors will be uninjured. It is a better mode than the old one of soap and water, and it is also quicker about.

Window-cleaning should be done by men, if the windows are high up. No woman should be allowed to run the risk of breaking her neck from a height, nor to stand where she is indelicately exposed to observation, but she ought to clean the inside of the windows with the footman or hired cleaner.

Plate-glass is best cleaned with wet whiting, which is afterwards washed off, and the glass is rubbed with a chamois leather.

If paint-splashes have been left on the panes of glass by the painter, it can be removed by washing the glass with soda and water, which will quite clear it from them.

Board Cleaning.—Boards should never be rubbed across, but up and down the boards. After being well scrubbed with soap, hot water and a brush, they should be washed over again with clean water and soft cloth, and then well dried by hard rubbing. To extract oil from boards (it is frequently upset on them by careless painters), make a lye of pearl-ashes and rain water; add to it unslacked lime as much as the water will absorb; stir well together; let it settle, and bottle for use. Dilute it with rain-water when required, and wash the greasy spots quickly with it. Do not let it remain wet, for fear of discoloring the boards. Boards may be whitened by scrubbing them with soft water, sand, and slacked lime. This will also destroy insects.

How to Clean Carpets.—Carpets should be swept the way of the pile, with wet tea-leaves, to prevent the dust from flying over the curtains and furniture. A short-handled soft brush should be used for valuable carpets, and the servant must sweep it with care once a week. Once a year carpets should be well shaken.

Bedroom carpets should be wiped over, especially under the bed, with a damp cloth every day, or at least three times a week.

The house-wife who has her carpets wiped with a damp cloth daily (if mud be on them, the spots must first be brushed off), will find that it is only necessary to sweep them once a week, and that they will last for years longer than if they were swept daily. Of course the cloth must not be wet, only damp enough to pick up flue and dust. But, however it is cleaned, be sure that it is done often and effectually, for the sake of health.

Polished floors, well varnished, with a mere strip of carpet by the side of the bed (in bedrooms), is better and healthier than our present carpeted rooms.

For Removing Grease from Carpets.—Half a wineglassful of fuller's earth, half a wineglassful of magnesia. Mix the above in a basin with boiling water; put it hot on the grease spot, or spots, and leave it on till it is dry, then brush it off, and you will find the spots are gone. Or, if the grease is recent, lay a sheet of blotting-paper over it and iron over the spot with a hot flat-iron; it will come out in the blotting-paper, but you must keep moving the paper and applying fresh parts of it till the heat has absorbed the whole of the grease.

To Remove Ink from Carpets.—If the ink is just spilled, take up as much as you can with a spoon and with blotting paper. When you have taken off all that is possible, wash well with skim milk (London milk does as it is), then wash again

with hot water. As soon as the accident happens, wet the place with juice of sorrel, or lemon, or vinegar, and the best hard white soap. Old ink-stains are hard to get out; but they can be removed by first wetting the spot and then applying salts of sorrel. Wash off immediately, however.

Fuller's earth, mixed with lemon juice, will also take other stains out of carpets.

Carpets should not be swept with a whisk-brush above once a week. It wears them out if it is used oftener.

To Clean Floor Cloths.—Sweep them and wash them now and then with milk; never scour them with a brush, or use soap or hot water on them, as it would take off the paint. A soft cloth and lukewarm water are all that is required to clean them.

Oil-cloths are washed, when they require it, with a soft flannel wetted with milk; or, with a mixture of salad-oil and weak table beer. Never use soda or soap to them.

To Clean Greasy Cocoanut Matting.—Thoroughly scrub it all over with hot water and soap, then loosely fold it and put it into a large washing-tub. Pour a quantity of cold water over it, then hang it out on a line in the sun to dry.

To Clean Straw Matting.—Wash as seldom as possible; but when it becomes imperatively necessary to do so, use salt and water. Salt will prevent the matting from turning yellow. Dry as fast as you wash, and wash only a small space at a time.

Stained boards are dusted and polished as stained furniture would be.

To Clean Glass.—Tumblers and wineglasses should be washed in cold water in which a little soda is dissolved, then turned up to drain, dried with a soft, clean, and dry cloth, and finally polished with a leather or an old silk handkerchief. Chandelier or lustre glasses are washed in the same way. Decanters require careful cleaning. First have ready some strong suds of white soap and water and a little pearlash. Mash up an egg-shell well, drop it into the bottle, pour in some of the soap-suds, and shake it well about till the bottle is clean, then empty it; put in fresh suds and clean inside with a small sponge on the end of a glass-stick; rinse out twice with clean cold water. Next put them into the soap-suds, and if they are cut wash them with a regular glass-brush; next rinse the outside. Dry the inside with a clean piece of linen on the end of your glass-stick. Wipe the outside with a dry glass-cloth, and polish off with a leather or silk handerchief.

To Remove Rust.—To remove rust from steel, cover with

sweet oil, well rubbed on it; in forty-eight hours use unslacked lime, powdered very fine. Rub it till the rust disappears. To prevent the rust, mix with fat oil varnish four-fifths of well-rectified spirits of turpentine. The varnish is to be applied by means of a sponge; and articles varnished in this manner will retain their brilliancy and never contract any spots of rust. It may be applied to copper, philosophical instruments, etc.

To Distinguish Iron from Steel.—Let a drop of diluted nitric acid fall on the metal, and, after a few minutes, wash it off with water. If the metal be steel, a black spot will be left on it; if it be iron, a whitish spot will remain. The reason is that the nitric acid dissolves the iron in both cases, but the charcoal that enters into the composition of the steel remains undissolved, and constitutes the blackness.

To Clean Marble.—One ounce of potash, two ounces of whitening, and a square of yellow soap, cut into small pieces; boil altogether in a saucepan, until it begins to thicken; apply this with a large brush to the marble. If the marble is very dirty, let it remain all night; if not, one hour will be sufficient. Then wash it carefully off with plenty of cold water and a sponge. Take care the mixture is not applied too hot. Or:

Equal quantities of soft soap and pearlash.

Put the soap and pearlash on the chimney-piece with a soft flannel; let it lie on for a few minutes. Wash it off with warm water, not too hot; wash it over a second time with cold spring water. Acids act on marble. Marble is itself composed of carbonate of lime—that is, it is a compound of carbonic acid and lime. Now the carbonic acid has a comparatively weak affinity for lime, and most other acids will prevail over it and take its place when brought into contact with it; thus destroying the texture of the stone, liberating the carbonic acid, and leaving some salt of lime, in the form of a white powder, in its place.

When marble has had its polished surface eroded by acids—and even lemon juice or vinegar will do this readily—the only mode of reparation is to have the marble again polished by the use of polishing powders, such as emery.

Neither spirits nor water produce any permanent effect on marble, but fixed oils and grease soak into its substance, and it is impossible to remove them, as any agent potent enough to act on the grease will also destroy the texture of the marble. A portion of the grease may be extracted by covering with fuller's earth or pipeclay. But marble should be carefully preserved from contact with grease or oil.

To Clean Brass.—Rub it with a little sal ammoniac finely powdered and wet. Warm the brass first; polish with wash leather. Or:

Rub with a soft wash-leather dipped in sweet oil; then with finely powdered rotten-stone. Polish with wash-leather. The Americans use powdered rotten-stone, well mixed with a pint of water. Then a teaspoonful of sulphuric acid is added. This mixture is applied gently, then rubbed off, and the brass polished with powdered whiting which has been sifted through muslin. Use wash leather in all cases. Some persons wash the brass with the sulphuric acid and water, and then polish with rotten-stone, etc., etc.

To Clean Real Bronze.—Wash the ornaments gently (with a sponge) with soap and water, then rinse them in beer. Do not wipe it off or rub the ornaments at all, but place them in a spot at a little distance from the fire, until they are quite dry. Use very little soap.

Bronzed chandeliers, lamps, etc., should be only dusted with a feather brush or soft cloth. Washing takes off the bronzing.

To Clean Gilt Lamp and Chandeliers.—Wipe off the dust with a soft cloth, and wash gently with fine soap-suds and soft lukewarm water. Any wrought work may be carefully cleaned out with a very soft tooth-brush.

To Clean Steel and Iron.—One ounce of soft soap, two ounces of emery, make it into a paste; then rub the article for cleaning with wash-leather, and it will give a brilliant polish.

For Removing Paint from Wood.—Mix one pound of soda, such as is used for washing, two pounds of lime, unslacked. If the paint is very strong on the wood, add one-half pound of potash.

Mix these ingredients together, and dilute with water until the mixture becomes rather thicker than whitewash, and then rub it on the paint with a piece of wood folded up in rag. The person who uses this preparation must be careful not to touch it with his hand.

To Clean Japanned Waiters, Urns, Etc.—Rub on with a sponge a little white soap and some lukewarm water, and wash the water or urn quite clean. Never use hot water, as it will cause the japan to scale off. Having wiped it dry, sprinkle a little flour over it; let it rest awhile, and then rub it with a soft dry cloth, and finish with a silk handerchief. If there are white heat marks on the waiters, they will be difficult to remove. But you may try rubbing them with a flannel dipped in sweet oil, and afterwards in spirits of wine. Waiters and other articles of *papier mache* should be washed with a sponge and cold water, without soap, dredged with flour while damp; and after a while wiped off, and then polished with a silk handkerchief.

Wood Furniture.—The greatest care should be taken to keep furniture fresh and clean. If the house-wife is neat and careful her property will last much longer than otherwise, and her dwelling will always possess a charm too often wanting in more pretentious dwellings.

Furniture which is French polished should be carefully dusted every day, and polished once a week, with the furniture polish to be bought at any good chemist's. Generally these polishes are better and really cheaper than any that the housekeeper can make herself. The chemical and mechanical action of different substances on articles of furniture is very little understood by persons in general, and consequently the most absurd directions are frequently issued for the preparation of cleaning materials, and also for preventing injury from certain agents. The substances from which furniture is chiefly exposed to injury are water, oils, spirits of various kinds, such as brandy, eau-de-Cologne, benzine, etc., and acids.

Varnishes, or polished surfaces of wood, are easily injured by volatile mineral spirits, such as those used for lamps, or by any alcoholic spirit, as brandy or wine. The polish is composed of gums and resins which are soluble in spirits. Many of these polishes or varnishes are made by dissolving the materials in alcohol, then when they are applied the spirit evaporates and the gum or resin is left in a thin polish or varnish on the wood. Of course, if wine, brandy, or spirits of wine fall on it, a portion of it is again dissolved, and the brilliancy of the surface is destroyed. The only remedy for these kinds of stains or marks is to have the table, or whatever it may be, repolished.

Heat has the same effect on French polish. A hot plate, or dish, or cup, or mug, placed on it, leaves its shape as a dull mark on the table. Therefore dining tables are better not French polished, but well rubbed with oil. When furniture is not French polished, it is well to rub it with linseed oil, slightly colored with alkanet root. Every time the dinner table is rubbed all the leaves should be put in, so that the portions of the table may be of the same color, for oil darkens mahogany, and if the leaves are not rubbed every time there will soon be a great difference of shade between them and the table.

A Capital Recipe for Polishing Tables.—Cold-drawn linseed oil, one pint; spirits of wine, one ounce; white tonic vinegar, one pint; spirits of turpentine, one ounce; powdered gum arabic, one-half once; butter of antimony, one and one-half ounce; spirits of salt, one ounce.

The above ngredients to be well mixed together and shaken previous to being used.

Family Recipe for Polish for Furniture not French Pol-

ished.—Three ounces of beeswax; three ounces of hard white soap; one ounce of spermeceti, cut up small and simmered in a pint of water, keeping it stirred all the time. Pour it into a jar and keep it well covered.

French Polish.—We give the following excellent recipe, which proves experimentally to be good for those who may wish to polish a table or box for themselves, premising that the surface to which it is applied must be perfectly cleaned first:

Shellac, one ounce and a half; mastic, half an ounce; sandarac, half an ounce; rectified spirits of wine, two ounces. Pound the gums very finely in a mortar, and put them in a bottle which will rather more than hold the whole quantity; stand the bottle in a kettle of cold water, which bring slowly to a boil; let it boil for some time, until the contents of the bottle become like treacle (this requires great care), stirring the while with a wire rod. Roll several yards of flannel list into a flat coil, put a little sweet oil on it, and cover with a piece of old linen; on this apply the polish.

Furniture Polish.—Half a pint of spirits of wine; one-half ounce of gum shellac; one-half once of gum benzoin; one-half ounce of gum sandarac.

Put the whole into a bottle for a day or two, and shake it a few times. When the gums are dissolved it is fit for use. When you think the polish is laid on thick enough, take a clean wad and cloth, put a little clean spirits of wine on the wad, the same as you did the polish, and rub it up the same way, but rub very lightly, and rub until quite dry. You must put a little oil on the cloth, the same as in laying on the polish.

For Polishing Furniture.—Half a pint of vinegar; half a pint of linseed oil; two pennyworth of butter of antimony.

To Clean the Face of Soft Mahogany or other Wood.—After scraping and sand-papering in the usual manner, take a sponge and well wet the surface to raise the grain; then with a piece of fine pumice-stone, free from stony particles, rub the way of the fibres; rub the wood in the direction of the grain, keeping it moist with water; let the wood dry then; if you wet it again you will find the grain much smoother, and it will not rise so much; repeat the process, and you will find the surface perfectly smooth, and the texture of the wood much hardened. By this means common soft Honduras mahogany will have a face equal to Hispaniola. If this does not succeed to your satisfaction, you may improve the surface by using the pumice-stone with cold drawn linseed oil, in the same manner as you proceeded with water; this will be found to put a most beautiful, as well as durable, face to the wood, which must then be polished or varnished.

To Clean and Lay by Curtains.—In summer it is usual to lay by curtains of rep, damask, or chintz, and replace them with lace or muslin curtains, which look much cooler, and the more expensive rep and chintz are preserved by it. Rep curtains should be well brushed and shaken; wrapped in linen cloths, and put away (protected by bags of pepper, cedar shavings, or camphor, from the chance of moths) in a dry closet or a deep drawer. Chintz should be spread on a long table and rubbed all over with clean bran and flannel, which cleans the glaze nicely. Then fold and lay them by. If chintz curtains have the dust blown off them once a week by a pair of bellows, and are taken down and well shaken once a quarter, they will last seven years without requiring cleaning. The writer speaks from experience in this matter. It is wiser to have lace and muslin curtains cleaned than washed, and quite as cheap. Chintz should also be sent to be cleaned and re-glazed when dirty.

To Clean Covers which are not Silver.—Put a piece of mottled soap (about two ounces) and about the same quantity of whiting into a jug and pour boiling water on it; mix till it becomes a thick paste, quite smooth. Then rub it on the covers, let it dry, and rub off with dry whiting and a leather. This preserves the cover from being scratched. The insides and outsides of covers should be carefully wiped the moment they are brought from the table.

There are also pastes sold for cleaning covers, about the best of which is Graham's paste; but the old fashioned mode of using soap and whiting for the purpose does very well, and preserves the covers longer.

When they are plated, they are best cleaned like other plate, with gin and whiting mixed, or with rouge powder.

To Clean Tins.—Clean tins as you would clean covers, with soap and whiting mixed to a cream in boiling water. Lay it on with a piece of leather; let it dry, and then rub it off with dry whiting and a clean leather.

To Clean Copper and Brass.—Mix oil and brickdust, or oil and finely powdered rotten-stone (sifted through muslin) together; rub it on with a piece of leather; let it rest a little while on, and then rub off with a dry soft leather.

Many people use oil of turpentine and rotten-stone, but the copper very soon tarnishes after its use; others use oxalic acid, but this is so dangerous a poison, and so painful if it chance to get into the servant's eyes, that we strongly object to its use.

To Clean Lacquered Brass.—Wash with a stiff lather of soap and water; let the brass lie in it for three days, taking it

out every day and brushing it with a hard brush; let it dry, and then rub it with a leather.

To Clean Stair-rods.—Mix finely powdered rotten-stone and sweet oil to a paste, then rub it on each rod with a piece of flannel or woolen. Polish with the dry powder of the rotten-stone and a nice leather.

The same mixture, carefully applied to inlaid brass or brass handles of furniture, answers very well; but care must be taken not to let it lodge in any network or hollows of the brass.

To Clean Candlesticks.—Melt all the wax or grease off with boiling water; but on no account melt it by putting the candlesticks before the fire, as it melts the solder. Tin candlesticks must be cleaned as other tins are. Plated candlesticks should be cleaned with plate-powder.

To Clean the Insides of Pots, Pans and Kettles.—Boil in the kettle or pot a little sal-ammoniac for the space of one hour, to remove the fur. Be sure to wash out a dirty saucepan with boiling water the moment you finish using it.

To Clean Steel or Iron.—Make a paste of two ounces of soft soap and four of emery-powder—that is, two ounces of coarse emery-powder and two of fine. Put this paste on fire-irons, fenders, etc., and afterwards rub off with dry wash leather. Some people use crocus powder moistened with sweet oil. This is best for polished steel.

To Take Rust out of Steel.—The steel must be covered with sweet oil, and left for 48 hours, then rubbed with leather, and this must be repeated till the rust is removed. Or, you may rub it with the finest emery-paper.

To Clean Cast Iron and Black Hearths.—Mix together black lead and whites of eggs to a liquid consistency; paint the stove, etc., all over with it, and rub bright with a hard brush.

To Clean Looking-Glasses.—Wash them with spirits of wine; dry them; powder slightly with whiting, and rub off with a leather. Take care that the whiting does not get into the edge of the frame.

Polish the mahogany frames with furniture paste. Beware of spilling scents on polished looking-glass frames, as it removes the polish.

To Clean Plate.—Plate should be treated with great care. Never put it into a basket or tray with knives, nor mix spoons with forks, for fear of making scratches which nothing will remove. Wash it directly it comes from table with warm

water and soap, rinse it in cold water, wipe it, rub it well with a leather. Never suffer mercurial preparations to be used for silver. It is a really saving plan to boil it for half an hour in soft water, with whiting and yellow soap enough to make a lather. Rinse it with cold water, wipe with a soft towel, and rub with a leather.

Gas blackens silver sadly, and the deep stain can only be removed by a plate-powder. Rouge (which is made by the precipitation of sulphate of iron by carbonate of potash), is most generally used, and does very well. In our own household the plate is cleaned by first being nicely washed in warm water and wiped dry. Then a mixture is made of whiting and gin, or spirits of wine (which is in many respects better), and it is rubbed wet on the silver. A sponge is used to rub this mixture on, as it is soft. It is let dry very thoroughly, so that it will rub off like powder with a piece of flannel; then it is polished with a chamois leather. Be sure that the whiting is reduced to the finest possible powder. It should be ground quite fine and even, then sifted through coarse book-muslin, as any rough bits will scratch.

To Take Stains out of Silver.—Steep the plate in soap, let it lie for four hours, then cover it with whiting wet with vinegar, so that it may stick upon the silver, and dry it by the fire; after which rub off the whiting, rub it over with dry bran, and the spots will disappear, and the plate look bright.

To Remove Ink Stains from Silver.—The tops and other portions of silver ink-stands frequently become deeply discolored with ink, which is difficult to remove by ordinary means. It may, however, be completely eradicated by making a little chloride of lime into a paste with water, and rubbing it upon the stains.

An Old Family Recipe to Make Old Plate Look Like New.—Take of unslaked lime and alum a pound each; of aqua vitæ and vinegar each a pint; and of beer grounds two quarts; boil the plate in these ingredients, and it will receive a beautiful polish from them.

Plate is best polished by the naked hand, but the operation gives some pain to the rubber. Jewelers thus polish plate, but it requires the thick-skinned, yet soft palm of a practiced hand to do it.

Egg-spoons get discolored and tarnished by the sulphur in the egg uniting with the silver as soon as it is moistened by saliva. This tarnish is a sulphuret of silver, and may easily be removed by rubbing it with table salt or a little hartshorn.

Let the plate in use be counted over every night—a card

with a list being kept in the plate-basket—and the basket carried to the master's or lady's room.

To Clean Britannia Metal.—Finely powdered whiting, two tablespoonfuls of sweet oil, and a little yellow soap melted to some thickness; mix, with a little spirits of wine. Rub this cream on with a sponge or soft flannel, wipe it off with a soft cloth, and polish with a leather.

To Clean a Metal Teapot.—Pour into it a solution of common soda boiling hot; let it stand twelve hours near the fire; then pour it away, and wipe with a clean cloth.

To Clean Gilding.—Brush off dust with a feather brush. Never wipe with linen, it takes off and deadens the gilding.

To Clean Steel Knives and Forks.—The moment used knives are taken into the kitchen, they should be dipped in warm water and wiped, taking care not to wet the handles.

Knives are cleaned on a board covered with India-rubber, with brick-dust sold for the purpose. In some large families Kent's knife-cleaner is used. This machine saves labor, but requires care in putting the knives in. Printed directions and a powder for it are sold with the machine.

Knives are cleaned on the board by being rubbed smartly on it, with brick-dust spread on the surface. Steel forks are washed, dried and also rubbed on the board with brick-dust. The intervals between the prongs are cleaned with a small bit of stick wrapped in leather and rubbed in brick-dust.

Knives are often stained by fruit or vinegar. The stains can be removed by rubbing them with a piece of raw potato before they are cleaned on the board.

To make Windows like Ground Glass.—Make a hot solution of sal-ammoniac. Brush the solution over the pane or panes; the moisture will instantly evaporate and leave a beautiful radiated deposit.

Flies.—House-flies are very destructive to furniture. They may be effectually destroyed by mixing half a spoonful of ground black pepper, a teaspoonful of brown sugar, and a teaspoonful of cream. Place the mixture in a room where flies are troublesome.

Or:—Put saucers of strong green tea, sweetened, about the room. This will poison flies.

They also dislike elder leaves, and will keep away from them.

To Kill Beetles or Crickets.—Parings of cucumber strewn near their holes, or strong snuff.

To Get Rid of Ants.—A little green sage placed in their haunts will drive them away. Quick-lime scattered over their hills and watered will destroy them.

How to take Ink out of Boards.—Strong muriatic acid or spirits of salts, applied with a piece of cloth; afterwards well washed with water.

To take out Spots of Ink.—As soon as the accident happens, wet the place with juice of sorrel or lemon, or with vinegar, and then rub with best hard soap.

Cement for Glass.—Equal parts of flour, powdered chalk, and finely pulverized glass; half the quantity of brick-dust, scraped lint, and white of egg.

To Preserve Water Fresh.—Put into the barrel or cistern 3 lbs. of black oxide of maganese, powdered; stir it well, and the water will keep good an indefinite time.

To Wash Flannel Without Shrinking it.—Have plenty of hot soft water, make a suds with good soap, rub the clothes clean and rinse out all the soap. Do not let the clothes cool from the time they are wet till they are ready to put on the line. Put them into the next suds, or the rinsing water, as fast as wrung out, and let them cool in the basket before you hang them up. Wash them in the morning, on a sunshiny day, if possible, so they will have a good chance to dry.

To Wash Colored Flannels.—Make a suds of cold water and ordinary bar soup; wash the garment and rinse in cold water. Press while it is still damp. In this way children's fancy sacques and bright dresses may be kept looking like new, neither shrinking nor changing color. Don't be afraid to try it.

To Remove Grass Stains.—Pour boiling hot water on the stains before washing the garments.

Nice Glossy Starch.—To three cupfuls of water take three rounded teaspoonfuls of starch, a pinch of salt, and one teaspoonful of powdered borax. Dissolve your borax in part of the water; then add starch and salt; dip your collars, cuffs and bosoms into the starch. Your irons must be good; rub them with bees-wax, and we promise you a stiff, glossy surface with never a failure.

To Remove Iron Rust Stains.—Moisten the spot with a solution of Epsom salts in a few drops of hot water, and rub in well once or twice; then fill a tin vessel with boiling water and set it on the stain; rinse in cold water.

To Remove Mildew.—Rub common brown soap on the spot, and scrape white chalk in it. Keep wet and lay in the sun.

To Remove Scorches.—Scorches made by over-heated flat irons can be removed from linen by spreading over the scorched cloth a paste made of the juice pressed from two onions, one-half ounce of white soap, two ounces of fuller's earth, and half a pint of vinegar. Mix, boil well and cool before using.

To Prevent Blue Fabrics from Fading.—Dissolve two teaspoonfuls of sugar of lead in one gallon of water, soak the stockings or cloth in this solution from half to one hour, according to material. Delicate fabrics need to soak only until saturated; rinse before washing and wash quickly.

Blueing.—One ounce of best Prussian blue, half an ounce of oxolic acid, one quart of soft water. Heat enough of the water to dissolve the acid, then stir in the blue, add cold water and bottle for use; keep in the cellar.

To Clean Silk Dresses.—Equal quantities of alcohol, molasses and soft soap; one pint of each will do two dresses; beat well together, and after spreading a breadth of silk on a clean kitchen table, scour it with an old but clean clothes brush; have three tubs or pails of water, take up the breadth of silk by the top and dip it up and down in first one pail, then the second, and then the third. When there is no color left in the water the rinsing is complete. Pin the breadths to the clothes-line without wringing. When a little damp press out with a cold iron. Before cleaning rub the grease spots with pure naptha or gasoline. We have used this horrid-looking mixture with the best success on even light silks and silk with white stripes.

Paint Spots.—When neither turpentine nor benzine will remove paint spots from garments, try chloroform. It will absorb and remove paint which has been on for six months.

A Cure for Bedbugs.—Gosoline or a strong solution of ammonia are both good remedies.

The only sure remedy that, in the course of seventeen years, we have invariably found efficacious, is a preparation of copperas, one pound to one gallon of boiling water. The most infected house we ever saw was cleared by filling a syringe with this fluid and shooting it into the cracks and crevices of the rooms and walls. Sponging or painting the bedstead with this solution will keep them away for months and forever. The only drawback to this is that it leaves a stain like iron rust.

Oil of cedar is an excellent and cleanly remedy. Salt and kerosene oil in cracks and under base boards is good.

To Drive Away Mice.—Moisten chloride of lime, and stop their holes of ingress with the paste. If the holes are inaccessible, set the chloride around on small plates. Mice do not like it.

To Get Rid of Black Ants.—Get five cents worth of tartar emetic; mix in an old saucer with sugar and water, and set in your pantry or cupboard, where the ants trouble you. In twenty-four hours every ant will have left the premises. With me the same dish of tartar emetic answered as well the second year as the first; as the water dries out add more.

Dyeing.—It may be necessary to remark, once for all, that every article to be dyed, as well as everything used about dyeing, should be perfectly clean.

In the next place, the article to be dyed should be well scoured in soap, and then the soap rinsed out. It is also an advantage to dip the article you wish to dye into warm water, just before putting it into the alum or other preparation; for the neglect of this precaution it is nothing uncommon to have the goods or yarn spotted. Soft water should always be used if possible, and sufficient to cover the goods handsomely.

As soon as an article is dyed it should be aired a little, then well rinsed, and afterwards hung up to dry.

When dyeing or scouring silk or merino dresses, care should be taken not to wring them; for this has a tendency to wrinkle and break the silk.

In putting the dresses and shawls out to dry, that have been dyed, they should be hung up by the edge so as to dry evenly.

Chrome Black.—For Woolen Goods.—For five pounds of goods, blue vitriol, six ounces; boil it a few minutes; then dip the goods three-quarters of an hour, airing often; take out the goods, and make a dye, with logwood, three pounds; boil one-half hour; dip three-quarters of an hour, and air the goods, and dip three-quarters of an hour more. Wash in strong suds. This will not impart any of its color in fulling, nor fade by exposure to the sun.

Black on Wool.—For Mixtures.—For ten pounds of wool, bichromate of potash, four ounces; ground argal, three ounces; boil together, and put in wool; stir well, and let it remain in the dye four hours. Then take out the wool, rinse it slightly in clear water; then make a new dye, into which put logwood, three and one-half pounds. Boil one hour, and add chamber lye, one pint, and let the wool lie in all night. Wash in clean water.

SNUFF BROWN.—DARK, FOR CLOTH OR WOOL.—For five pounds of goods, camwood, one pound; boil it fifteen minutes, then dip the goods for three-quarters of an hour; take out the goods, and add to the dye, fustic, two and one-half pounds; boil ten minutes, and dip the goods three-quarters of an hour; then add blue vitriol, one ounce; copperas, four ounces; dip again one-half hour; if not dark enough, add more copperas. It is dark and permanent.

WINE COLOR.—For five pounds of goods, camwood, two pounds; boil fifteen minutes; then dip the goods for one-half hour; boil again, and dip one-half hour; then darken with blue vitriol, one and one-half ounce; if not dark enough, add copperas, one-half ounce.

MADDER RED.—To each pound of goods, alum, five ounces; red, or cream of tarter, one ounce; put in the goods, and bring your kettle to a boil for one-half an hour; then air them, and boil one-half hour longer; then empty your kettle, and fill with clean water; put in bran, one peck; make it milk warm, and let it stand until the bran rises; then skim off the bran, and put in madder, one half pound; put in your goods, and heat slowly until it boils and is done. Wash in strong suds.

GREEN.—ON WOOL OR SILK, WITH OAK BARK.—Make a strong yellow dye of yellow oak and hickory bark in equal quantities. Add the extract of indigo, or chemic, one tablespoonful at a time, until you get the shade or color desired.

BLUE.—QUICK PROCESS.—For two pounds of goods, alum, five ounces; cream of tartar, three ounces; boil the goods in this for one hour; then throw the goods into warm water, which has more or less of the extract of indigo in it, according to the depth desired, and boil again until it suits, adding more of the blue if needed. It is quick and permanent.

STOCKING YARN, OR WOOL, TO COLOR.—BETWEEN A BLUE AND PURPLE.—For five pounds of wool, bichromate of potash, one ounce; alum, two ounce; dissolve them, and bring the water to a boil, putting in the wool, and boiling one hour; then throw away the dye, and make another dye with logwood chips, one pound; or, extract of logwood, two and one-half ounces; and boil one hour. This also works very prettily on silk.

Whenever you make a dye with logwood chips, either boil the chips one-half hour, and pour off the dye, or tie up the chips in a bag, and boil with the wool or other goods; or, take two and one-half ounces of the extract in place of one pound of the chips is less trouble and generally the better plan. In the above recipe, the more logwood that is used, the darker will be the shade.

Scarlet, with Cochineal.—For Yarn or Cloth.—For one pound of goods, cream of tartar, one-half ounce; cochineal, well pulverized, one-quarter ounce; muriate of tin, two and one-half ounces; then boil up the dye, and enter the goods; work them briskly for ten or fifteen minutes, after which boil for one and one-half hours, stirring the goods slowly while boiling; wash in clear water and dry in the shade.

Pink.—For three pounds of goods, alum, three ounces; boil, and dip the goods one hour; then add to the dye, cream of tartar, four ounces; cochineal, well pulverized, one ounce; boil well, and dip the goods while boiling, until the color suits.

Orange.—For five pounds of goods, muriate of tin, six tablespoonfuls; argal, four ounces; boil, and dip one hour; then add to the dye, fustic, two and one-half pounds; boil ten minutes, and dip one-half hour; and add again to the dye, madder, one teacupful; dip again one-half hour.

Cochineal in place of madder makes a much brighter color, which should be added in small quantities until pleased. About two ounces.

Purple.—For five pounds goods, cream of tartar, four ounces; alum, six ounces; cochineal, well pulverized two ounces; muriate of tin, one-half teacupful. Boil the cream of tartar, alum, and tin fifteen minutes; then put in the cochineal and boil five minutes; dip the goods two hours; then make a new dye with alum, four ounces; Brazil wood, six ounces; logwood, fourteen ounces; muriate of tin, one teacupful, with a little chemic; work again until pleased.

Silver Drab.—Light.—For five pounds of goods, alum, one small teaspoonful, and logwood about the same amount; boil well together, then dip the goods one hour; if not dark enough, add in equal quantities alum and logwood until suited.

Dark Colors.—To Extract and Insert Light.—This recipe is calculated for carpet-rags. In the first place let the rags be washed clean; the black or brown rags can be colored red, or purple, at the option of the dyer; to do this, take, for every five pounds of black or brown rags, muriate of tin, three-quarters of a pound, and the lac, one-half pound, mixed with the same as for the lac red; dip the goods in this dye two hours, boiling one half of the time. If not red enough add more tin and lac. The goods can then be made a purple by adding a little logwood; be careful and not get in but a small handful, as more can be added if not enough. White rags make a beautiful appearance in a carpet, by tying them in the skein, and coloring them red, green, or purple; gray rags will

take a very good green; the coloring will be in proportion to the darkness of mix.

Black.—For five pounds of goods, sumach, wood and bark together, three pounds; boil one-half hour, and let the goods steep twelve hours; then dip in lime water one-half hour; then take out the goods, and let them drip an hour; now add to the sumach liquor, copperas, eight ounces, and dip another hour; then run them through the tub of lime-water again for fifteen minutes; now make a new dye with logwood, two and one-half pounds; by boiling one hour, and dip again three hours; now add bichromate of potash, two ounces to the logwood dye, and dip one hour. Wash in clear, cold water and dry in the shade. You may say this is doing too much. You cannot get a permanent black on cotton with less labor.

Blue on Cotton or Linen.—With Logwood.—In all cases, if new, they should be boiled in a strong soap-suds or weak lye, and rinsed clean; then for cotton, five pounds, or linen, three pounds, take bichromate of potash, three-quarters of a pound; put in the goods and dip two hours; then take out and rinse; make a dye with logwood, four pounds; dip in this one hour, air, and let stand in the dye three or four hours, or till the dye is almost cold; wash out, and dry.

Green.—If the cotton is new, boil in weak lye or strong suds; then wash and dry; give the cotton a dip in the home-made dye-tub, until blue enough is obtained to make the green as dark as required; take out, dry, and rinse the goods a little; then make a dye with fustic, three-quarters pound; logwood, three ounces to each one pound of goods, by boiling the dye one hour; when cooled so as to bear the hand, put in the cotton, move briskly a few minutes, and let it lie in one hour; take out, and let it thoroughly drain; dissolve and add to the dye, for each pound of cotton, blue vitriol, one-half ounce; and dip another hour; wring out and let dry in the shade. By adding or diminishing the logwood and fustic, any shade of green may be obtained.

Yellow.—For five pounds of goods, sugar of lead, seven ounces; dip the goods two hours; make a new dye with bichromate of potash, four ounces; dip until the color suits, wring out, and dry; if not yellow enough, repeat the operation.

Red.—Take muriate of tin, one-half of a teacupful; add sufficient water to cover the goods well, bring it to a boiling heat, putting in the goods one hour, stirring often; take out the goods and empty the kettle, and put in clean water, with nic-wood, one pound, steeping it for one-half hour, at hand heat; then put in the goods, and increase the heat for one hour,

not bringing to a boil at all; stir the goods, and dip an hour as before; wash without soap.

GREEN.—VERY HANDSOME WITH OAK BARK.—For one pound of silk, yellow oak bark, eight ounces; boil it one-half hour; turn off the liquor from the bark, and add alum, six ounces; let it stand until cold; while this dye is being made, color the goods in the blue dye-tub a light blue; dry and wash; then dip in the alum and bark dye; if it does not take well, warm the dye a little.

YELLOW.—For one pound of silk, alum, three ounces; sugar of lead, three-quarter of an ounce; immerse the goods in the solution over night; take out, drain, and make a new dye with fustic, one pound; dip until the required color is obtained.

N. B.—The yellow or green for wool works equally well on silk.

CRIMSON.—For one pound of silk, alum, three ounces; dip at hand heat one hour; take out and drain, while making a new dye, by boiling ten minutes, cochineal, three ounces; bruised nut-galls, two ounces; and cream of tartar, one-quarter ounce, in one pail of water; when a little cool, begin to dip, raising the heat to a boil, continuing to dip one hour; wash and dry.

DOMESTIC PETS.

This is a very comprehensive title, and might fairly be supposed to comprise ponies, donkeys, dogs, cats, rabbits, poultry, and pigeons; but this article will be confined to animals kept in the house, and will especially relate to those which may be legitimately called pets, the care of them devolving entirely upon their owners. Out-of-door pets must nccessarily be left, in a great measure, to the care of servants, and cannot be so essentially home friends. The following remarks are by a well known writer:

Squirrels, dormice, and white mice are sometimes kept in captivity by those whose lives are chiefly spent in towns, and who have no knowledge of the wild and frolicsome creatures in their native haunts; but they appear to lead very unnatural lives in confinement, and are not very desirable pets for the house. It is difficult to keep their cages quite sweet and clean. All may be domesticated, however, and are, we believe, capable of attachment to their owners. We have never kept any ourselves, but our brothers had dormice from time to time, and several small families were born and brought up under their care, but most of them came to an untimely end.

The Squirrel.—The squirrel seems so delightfully free and happy, playing about on the tops of the tallest trees in the woods, launching himself boldly into the air, and taking tremendous leaps from branch to branch, that, after seeing the pretty little creature at his ease, one does not feel inclined to deprive him of the liberty he seems so thoroughly to enjoy; but if he is captured, his life ought to be made as happy as

possible, and he should be allowed as much exercise as he can have in the house. His cage should be at least three or four feet long and three or four feet high, and instead of the revolving cylinder, which is very injurious to the little prisoner, he should have a good-sized branch of a tree, to form perches for him, and be able to frisk about at pleasure in his little parlor. A little sleeping-box must be attached to this, with a door at the back, and the board forming the floor should be drawn out like that of a bird cage. Every part of the cage must be kept as clean as possible, and the moss and cotton wool, which must be put into the squirrel's bedroom, must be changed nearly every day. The active little creature does not often live long in confinement; but if taken young, and very carefully managed, it may become a very tame and a very engaging pet, and may sometimes be trusted to frolic about out of doors when tame enough to return at his owner's call. His cage should, however, be lined with tin; for he is apt to gnaw the wood with his sharp little teeth when impatient of confinement. He should be fed on nuts, almonds, filberts, beech masts, walnuts, acorns, wheat in the ear, and fir cones; and he is fond of milk, cold tea, and bread and milk. A little bit of boiled potato, and even a tiny morsel of cooked meat, may be given as a treat, and a stale crust of bread to gnaw. All creatures require variety in their food, and in his wild state the squirrel gets animal food by robbing birds' nests of their eggs occasionally. He lays up a store of food for the winter in various holes and crevices, and is much too acute ever to put by a nut in which a maggot has been, or to miss the place where his treasure is concealed, even when several inches depth of snow covers the ground. The female is a very affectionate mother, and will remain with her young in the nest even while the tree in which it is, is cut down, or will carry them, one after another, in her mouth, to a place of safety. She generally builds on the topmost branches of the fir tree, and the nest is made of dry grass and sticks, very slightly yet firmly put together, and lined with fur, which she scratches off her body before the young ones are born. This is generally in the summer, and the young squirrels remain with their parents till the following spring, when they are able to manage for themselves. They have a substantial win-

ter's nest, to which they appear to add every year fresh layers of hay and moss, to make their habitation more and more warm and comfortable. It is said the best time to buy a squirrel is at the end of September, when it is fat and vigorous and its fur is in good condition; but it is never safe to purchase those which are sold in the street as "wonderfully tame," and which will allow themselves to be handled by a stranger, and pulled about, without showing any disposition to bite. The probability is that the poor little creatures have been stupified by some drug, and that they will either recover their natural ferocity in a few hours, or die—poisoned by the narcotic which has been given them.

The Dormouse.—The dormouse is very like the squirrel in many of its habits; it lives upon much the same food, and is a hybernating animal too, laying up a store of eatables for the winter, and passing the greater parts of the cold months in sleep. In a cage it is not seen to advantage; throughout the day it is generally rolled up into a little soft ball of fur, fast asleep, and its architectural talents are quite thrown away. It is, in its wild state, a very clever nest-builder. A writer gives a most fascinating description of a dormouse's nest, which he found in a hedge four feet from the ground, in the forking of a hazel branch, the smaller twigs of which formed a palisade round it. The nest itself was six inches long and three wide, and constructed of grass blades and leaves of trees. The blades of the sword-grass were chiefly used, and these were twisted round and between the twigs so as to form a hollow oval nest. Finer sorts of grass and the slender stems (not bigger than thread) of delicate climbing weeds, interwoven with the leaves of hazel and maple trees, were used for the bottom of the nest; the entrance to which was most ingeniously concealed by long blades of grass placed across it in such a manner as to spring back to their places, after having been pushed aside to admit the dormouse into the nest. This was never used as a storehouse; the little creature had its winter provisions carefully hidden under a thick branch in the neighborhood of the nest. While hybernating, the dormouse does not seem to require food; but it wakes up occasionally during the winter, perhaps when a warm sunny day calls it into life for the time, and then it takes food

before it rolls itself up and sleeps again. It requires a good deal of warmth, and must have soft hay, moss, and wool, given it to form its bed, and it does its best with these, but cannot construct anything very beautiful out of them.

If we had a tame dormouse, we think we should try and provide it with materials which it might be induced to use for the construction of a nest like that described. The dormice we once had were kept in a cage made for dormice, wired at one end, with a little compartment at the other boarded in, the door of which was pulled up and pushed down at pleasure, so that the little creatures could be shut into their bedroom when the outer room was cleaned out. Even with this precaution they were continually getting out of the cage, they were such nimble little animals, and the whole house was often searched in vain for the truants. At last, perhaps, they would be found in the fold of a curtain or underneath the cushion of a sofa. Sometimes a worse fate befell them, and they would creep under the cushion of an arm-chair, and get crushed to death, or be trodden under foot, or be squeezed under a door in trying to escape. They sleep during the day and come out in the evening, so that they must be provided with food as soon as it grows dusk; and, if they have a large cage with sticks placed across it, they will gambol about very merrily in the open part of it as soon as night approaches. Their food should be varied as much as possible; they will eat nuts and almonds, peas and beans, canary seed, and various other grains; and they are very fond of the milky juice of a dandelion or sow-thistle. We used always to put a little tin pan of milk into the cage every night, and they would often drink it all, especially when they had young ones. It is said that rabbits will be hindered from devouring their young by providing them with water, and that they would not eat them unless maddened by thirst or suffering from extreme hunger. Some dormice have the same propensity to cannibalism; and, if this theory about the rabbits be correct, it may apply also to the mother dormouse which devours her young. We thought she did so when alarmed for their safety, not being able to conceal them elsewhere; but it would be well to provide her with a constant supply of water or milk when nursing. The milk is useful too in

furnishing the dormouse with animal food; out of doors it eats insects. There are generally four or five young ones in a litter, born blind, but able to see in a few days, and they are soon capable of taking care of themselves. The cage must, of course, be kept perfectly clean, and the floor of the open part should be sanded like a bird cage.

Mice.—White, grey-and-white, and brown-and-white mice are sometimes kept in cages like those of the dormouse, and they must be treated in the same manner. The common brown mouse is said to be a more tractable and intelligent pet, and to be easily tamed by patient kindness. We never heard a mouse sing, but several instances are recorded of mice who have learned to imitate the chirp and even the song of a canary kept in the room in which they were; so that it might be worth while to try to give such pets the benefit of a musical education for the chance of their acquiring so curious an accomplishment. The little harvest mouse, the tiniest of British quadrpueds, has sometimes been kept in a cage, and will grow tame enough to take its favorite food, flies and other insects, from the hand. It is a most beautiful little creature, very active and agile, climbing about by means of its long tail and flexible toes, and leaping like a little Jerboa. It should have grains of wheat and maize, and canary seed, and plenty of water always in the cage; and wool or flannel and grass for its nest, which in its wild state is the most beautiful and elaborate construction of leaves and grass woven together into a round ball and suspended from strong grass-stems, wheat-stalks, or thistle-heads. In the winter it takes refuge in corn ricks, or burrows deeply in the earth, and makes a warm bed of grass. Even in confinement the harvest mouse will show its instinctive propensity to store up food for the winter, and if a number of grains of wheat or seed are given to it, will carry them off and hide them in its nest.

Birds.—None of these little creatures, however pretty and intelligent they may be, seem to us to be such desirable pets to be kept in the house as birds, to which the remainder of this article will be devoted. We can make them so happy, and they can tell us when anything is amiss with them so plainly—so thoroughly enjoying our petting, and becoming so attached

to us—that no trouble is thrown away upon our feathered pets.

On the whole, canaries flourish best in imprisonment. All the English finches do well in aviaries or cages; but one does not like to see them imprisoned while their brothers and sisters are flying about at large close by—one thinks they must envy them their liberty, and long to join them; while canaries would suffer extremly exposed to the cold of winter, if, indeed, they survived it. As regards other birds—robins, wrens, titmice, sparrows, &c.—it is much pleasanter to have them visiting us from the garden than to keep them shut up all the year round; and larks and nightingales are so completely out of their natural element in cages, that one cannot feel happy in keeping them. Any one who will take the trouble to feed the birds that congregate round the house in winter, may soon have a family of pensioners.

The robins will become our very familiar friends, hopping about at their ease on the breakfast-table, examining every article in the room with the utmost self-possession; will visit us regularly through the cold months, and, if they leave us in spring, will bring their young ones to make our acquaintance when they leave their nests. Crumbs of bread, potatoes, and scraps of fat will make a feast for the poor little hungry birds, driven by frost and snow to our doors; and the saucy tomtits and sparrows will afford us much amusement in return for our hospitality.

We may get much insight into the special characteristics of the birds by watching them when they are at their ease, and a hard winter will sometimes make them so tame, and so accustom them to our care, that they will hover about us out of doors, and peck at the windows for admittance at their usual feeding hours.

Although we do not advocate keeping English birds in confinement as a rule, it will sometimes happen that nestlings will be thrown upon our compassion, which have either fallen out of their nest, lost their parents, or have been taken captive by village boys, and are likely to come to a miserable end if not taken care of. Under these circumstances it is as well to know how to bring them up by hand. We once had several nests to

take care of, and all the young birds were reared and sent out into the world when able to take care of themselves; all but two bullfinches, which were given to a neighbor, who fed them upon hemp-seed—the consequence of which was that nearly all of their feathers fell off, and they were the most miserable little objects that can be conceived, and their little red-hot bodies were quite uncomfortable to touch. A course of warm baths and plenty of cooling green food, however, restored them to health and beauty, and they were returned to their owner with a warning against hemp-seed. It is said that a bullfinch fed entirely upon this heating feed will become blind.

Nestlings.—Nestlings should be fed upon bread soaked in water, squeezed nearly dry, and chopped up finely with rape-seed which has been scalded by pouring boiling water upon it, and leaving it till quite cold. Of course this food must be made fresh every day; if it grew sour it would kill the birds at once. About four quills full of it is enough for a meal for one young bird; but they generally clamor for food till they have enough, and then settle down to sleep again. They must be fed as soon as possible in the morning after sunrise, and will require food at intervals of from one hour and three-quarters to two hours throughout the day, the last meal being given about sunset, when they must be covered up for the night. The best plan is to keep the nest in a shallow box, over which a board can be laid to darken it, otherwise the birds will be asking for food every quarter of an hour. As soon as they hear a step in the room they begin to chirp; and when the box is uncovered they will stretch out their necks, and as they grow older jump out of the nest, and fly upon the hand or shoulder in their impatience for food. In time they will learn to feed themselves with the soft food, and by degrees pick up and shell the seed put into their cage; for, of course, they must be put into a cage as soon as they are fledged sufficiently to enable them to fly. It is best to crush the hemp-seed for them at first, but they soon learn to shell the canary and rape-seed.

The linnets and greenfinches we brought up by hand were very tame, and, although seed and water were always within their reach, we accustomed them to be fed by hand, and kept any food of which they were particularly fond—hemp-seed,

plantain, or chickweed, for instance, which all birds love—to be given them as dainties; so they always expected something nice, and would fly out of their cages and all round the room in their joy as soon as we opened the doors, returning to perch on the hand, shoulder or head when they wanted their food. The greenfinches were very bold birds, and as familiar as possible. They were great eaters, and very eager for their favorite food, so they always welcomed us very heartily; but we did not prize their affection so much as that of the linnets, which were naturally more shy and retiring, and required more courting and petting. They are very nice pets, and become very much attached to their owner, and their song is very sweet; but if kept in confinement they never acquire the red poll and breast which ought to distinguish the male bird in full plumage. They are fond of flax or linseed, but they must not have much of it or they will grow very fat. Canary and rape-seed should be the principal food both of linnets and greenfinches.

Goldfinch.—The goldfinch is a universal favorite, both from its beauty and sprightliness; it is very restless in a cage, and therefore, it hardly appears as contented as some less active birds; but it will live many years in confinement, and in an aviary is as happy as possible. It ought not to have a bell-shaped cage, as it is apt to grow giddy, twirling its beak along the wires. It is very easily tamed, and is capable of great attachment to its owner, and may generally be safely allowed a flight round the room while its cage is being cleaned. We had one which would fly across the room as soon as its cage door was opened, and perch on our shoulder for its favorite food of hemp-seed. It is rather fond of eating, and takes so much exercise that it requires plenty of food. It will not sing without a few hemp-seeds in the day,but it must not be fed solely upon this heating seed. Canary, rape, and poppy-seed should be the ordinary food of goldfinches. Lettuce, groundsel, chickweed, and water-cress, they should have frequently, and plantain in the winter; in the wild state they feed much on thistle-seed, and they should often have a thistle-head given to them, to pick the seeds out of it for themselves. They ought not to have sugar or sweet cakes, but they exceedingly enjoy a treat of biscuit, and Reading cracknels are very wholesome for them, and

thoroughly appreciated by goldfinches, bullfinches, and canaries.

The goldfinch is a very tractable bird, and there are many accomplishments which he will learn, and seems to exhibit with pleasure. He may be taught to fire off a small cannon, to feign death, and stand unmoved while fireworks are let off close to him, to mount a ladder, &c.; but when these tricks are made use of by his master to exhibit in public for pay, he is often treated with cruelty to make him a proficient in them. Many very harmless accomplishments he will learn, however, merely by patience and kindness on the part of his master—to open a box for his seed, to ring a bell when he wants food, to drag a little wagon up an inclined plane into his cage, and to draw up water from a little well underneath it. All these are easily taught, and the bird really seems to find pleasure in such little tasks. "One of my birds who lived in a cage so constructed as to have the seed always in a box of which he had to lift up the lid, and the water in a well to be drawn up in a bucket, was quite unhappy when his home was undergoing repair, and he had to live for a time in an ordinary cage, and sang his merriest song when he had to go to work with his little chain and pail again. I taught him to lift the lid of the box by having it open for one day, and then gradually lowering it by means of a piece of silk put round it, fastened at the back of the cage, till it was quite shut. He very soon found out that he must lift it up with his beak in order to reach the seed; and at last he became so crafty about it, that he would take out two or three seeds at once, and put a reserve by his side between the wires while he ate one. The cage was made with a wooden back, and the box was let into this above the door, and the lid fastened to the inside with two little hinges (care should be taken that the lid is not too heavy for the bird to lift easily, and that it should fall at once when not held up); a little bow window was constructed in the front of the cage, in the floor of which was a little hole with a wire across it, to which was attached a light silver chain fastened to a silver bucket about the size of a thimble. A small colored glass tumbler was fixed below the bow window, by means of four strong wires and a ring. This was filled with water and the bucket dropped into the well, and the bird hauled up the chain

with his beak, holding each fresh haul with his feet till the bucket came to the hole, and he could drink out of it. I taught him this accomplishment by filling the bucket with water, and putting it on the floor of the bow window to accustom him to look for water there; then I let it down by means of the chain pushed through two of the side wires by degrees, lowering it a little more every day. At first the bird pulled up the short bit of chain with his beak, and let it go before he could drink out of the bucket, but he gradually found out that he must hold the chain when he had drawn it up, and when he had once succeeded in doing this his education was finished; he never forgot the art, and often showed his delight in his task by singing when he had drawn up the bucket while his chain was under his feet, before he quenched his thirst. Of course it is necessary to see that the machinery of the bucket, chain, and well is always in order; any hitch preventing the bucket from falling into the well and getting refilled with water would cause the poor little bird to die of thirst. The bullfinch and siskin will readily learn this accomplishment, and I had a mule bird (whose parents were a goldfinch and canary) who learned it very quickly; but I never succeeded in teaching a canary to put his foot on the chain, though he would pull it up with his beak readily enough—of course, always to be disappointed by the falling down of the bucket. A goldfinch will learn to pull a little wagon up an inclined plane in the same way, and to take his seed out of it, the chain attached to the wagon having to be hauled in and held in the same manner. The way to teach him to ring for his food, is to suspend a little bell in a corner of his cage, and when he has been an hour or two without food, to ring it by means of a string attached to it, and immediately to place some of his favorite seed in the glass. In a few days he will discover that whenever the bell rings he gets a meal, and will seize the string, and peal away merrily whenever he is hungry."

The goldfinch is rather subject to epileptic fits, and, whenever he is seized with one, he should be plunged head downwards into cold water, and one or two dips will restore him at once. He is a large eater, and in all probability has indulged his appetite too much, so that he must be kept upon a low diet

of lettuce seed and thistles, and have no hemp-seed for a few days after he has had one of these fits.

He is fond of bathing, and should have a bath every day. The goldfinch will sometimes mate with the canary, and the mules are very pretty. He must, however, be taken away from his wife as soon as she begins to lay, as he has a mischievous propensity for breaking the eggs. After the young birds are hatched he may be put back into the cage, and will help in feeding them.

Canaries.—If our readers desire to have a nursery of young birds, they will find canaries the best in every respect to rear. There is no doubt about their happiness in a cage, if proper attention be paid to them; and we would fain believe that no one who reads these pages would willingly cause them suffering from want of care, or would attempt to keep pets upon whom they are not ready to bestow all the time and trouble necessary to keep them in health and comfort. People are not worthy of their birds if they neglect them, and leave them to the care of servants, to whom they are either troublesome or indifferent. And their attention will be received with such expressive gratitude and delight—their feathered pets will welcome them so gladly, and show so plainly how much their happiness depends upon their care—that they will be sufficiently rewarded for its bestowal. They should become intimately acquainted with their birds' dispositions, too, and learn their language thoroughly, and they will find a fund of amusement in their society. This is more easily accomplished when one or two pet birds are kept in a cage alone, than when there are a number of canaries together in a very large cage or aviary, but we always like best to see them under such circumstances—they seem so thoroughly happy when they have room for flying and frolicing about; some birds, too, will sing best when they are excited by emulation with others, but occasionally a good songster is sulky when in company, and prefers being alone. One of our birds who had been accustomed to a small single cage, never seemed at ease when in a large one, and resented being jostled by others. He was an old bird, too, and did not like his saucy young companions, and showed his displeasure by total silence whenever he was placed with them; so we had to restore him to solitary grandeur.

All through the autumn and winter months, about twenty or thirty birds will live very happily together, in a cage from three to four feet long, and two feet high and wide. This should be made of tin wire, as brass is apt to corrode, and communicate its poisoned green rust to the birds, when they rub their beaks against it; the iron rust is very good for them. The wood may be either mahogany or varnished deal. The arrangements for seed and water should be carefully attended to. If the former is put into the cage, the bird-hoppers are best to use, because the seed is kept clean, and only falls down as the birds peck and scatter away the husks beneath. A good plan is to have the seed and water in long, covered boxes outside the cage, with china or glass trays to take in and out of them. These can be kept perfectly sweet and clean, and the birds cannot make the seed or water dirty. Objections are made to the old-fashioned bird-glasses, because they are sometimes carelessly put into the wires which hold them, so that they slip aside, and the poor little birds cannot get at the water; but no provision for their comfort can succeed if carelessness be allowed at all. We do not advocate their use, however, for if they are very full the seed or water often gets spilt into the cage, and, if not, the birds have to stretch their little necks painfully to reach their food. Sometimes, too, a young bird will contrive in some mysterious fashion to get into the glass, and, having got in, cannot extricate itself. Nothing looks prettier at first than a fountain in the middle of the cage; but it becomes so dirty in a few hours that it is not well to use it. A bath, wired round like the cage, should be made to hang on the doorway, and the birds will go in and out and splash about in this, with the greatest delight. It must be taken away when they have all had a good washing, in cold weather especially, as some of them will go into the bath again and again, and get completely chilled. In winter the water must have the chill taken off, and whenever the sun shines they may have a bath safely. They must always have sand spread on the board at the bottom of the cage; and the coarse gravelly sand is best for them. It is a good plan to have a second board and two sets of perches for a large cage; this gives opportunity for washing and drying them thoroughly, and when the board

gets wetted by the splashing of the birds, it can be dried before it is returned to the cage. Of course the perches must be made to take in and out of the cage; they should be round and smooth like a bamboo. A swing suspended from the centre is a source of pleasure to the birds, and if the cage has a domed top, looks very pretty underneath it. They much enjoy having a pot of mignonette or of chickweed put in; and all perch eagerly about it, and soon devour every leaf and flower. No plant that would be injurious to them must be put either in or close to the cage, for they are sure to eat the leaves, and the beauty of the plant is destroyed in a few hours. A fir branch put into the cage occasionally gives them a good deal of amusement, and seems to do them no harm; but it is very soon reduced to a bare pole. Plantain is very good winter food for them, and they enjoy picking it from the stalk. Their food should have plenty of variety, to keep them in health and good humor. They must not have sugar or sweet cakes, but plain biscuits—cracknels for instance—are good for them. Their staple food should be canary and bird turnip (the small, brown summer rape) seed, a small quantity of hemp-seed each day, and occasionally, in cold weather, a pinch of maw, or poppy-seed, always to be given while the birds are moulting. When they are building they must have a mixture of hard-boiled egg and finely-crumbled stale bread, with a pinch of the same seed mixed with it every morning. It must always be made and given freshly, or it will turn sour and kill the birds. This food may be dispensed with while the hen is sitting; but as soon as she is about to hatch, it must be put in the cage for the young to feed upon.

Canaries ought to have green food three or four times a week, chickweed, groundsel, or lettuce. It is better for them to have a little constantly than a great quantity now and then, when they are apt to eat over-eagerly of it. They should have some whole oatmeal or grits every day; sometimes a little piece of bread soaked in milk, not boiled, unless it is given as medicine; a little lump of basalt to peck at, or a bit of apple, or pear, or potato, or rice pudding. All these tit-bits are, of course, to be considered as delicacies, to be given by the birds' owner, and they will help very much to win their affection.

They require warmth and nourishing food during moulting; if they seem weak, a rusty nail in the water gives them a little tonic, and a small piece of Spanish licorice is good for hoarseness. By way of physic, we have rarely found any of the many nostrums recommended as specifics of much use, excepting boiled milk. If they have been eating too freely of green food, a lump of chalk may be useful. Some bird-fanciers give ants' eggs and a spider occasionally, and it is likely that this animal food would be good for them now and then. Most birds are, to a certain extent, insectivorous in their wild state. Variety in their food is necessary for all birds; and if they have this, and the seed is good and sound, and they are not exposed to draughts or sudden changes of temperature, they will rarely have anything amiss with them which a warm bath will not cure. Whenever birds look moping, or when the hen is "egg-bound," and cannot lay her eggs, we give them a bath at 96°, holding the bird in hand while immersing all but the head in the water for three or four minutes, then taking it out and drying the feet, put it in the sunshine, or at a little distance from the fire to get dry. Sometimes, if a bird is not fond of bathing, the feet will get clogged, especially during nesting, when the claws get a bit of hair or cotton twisted around them occasionally, and the feet should be cleansed in warm water, and gently freed from their troublesome encumbrance.

An old bird's claws will sometimes grow too long, so that it cannot perch comfortably, and they must be very carefully cut, taking care not to draw blood, or to injure the bird in any way. Whenever possible, it is best to avoid catching the bird, especially if they are wild and fly about in alarm; but if taught to consider their owner as their friend, they will gradually submit; without much fluttering, to be taken hold of; and illness generally tames them sufficiently to make them quiet when they require to be taken out of the cage to be put into a bath.

Early in the spring, when the cock birds begin to fight, the hens should be taken away, and kept apart in another cage till the pairs are put together in March. Some people allow their birds to choose their own mates; but a great deal of quarrelling takes place before this, and two or three gentlemen will sometimes fix their affections on the same lady, and they will

get injured in the combats that ensue; besides which, if it be an object to secure good colored birds, it is necessary to put those together whose colors contrast well: a mealy cock with a jonque hen, or a green bird with a yellow partner. Handsomer birds are obtained by these selections than when two birds of the same color are paired; and two crested birds should never be put together, the young will probably be bald-headed. It is best to give an old wife to a young cock, and *vice versa*; and the birds of a family should never be mated together; the progeny will infallibly be weak and unhealthy if this is permitted. Two of our birds were accidentally paired, a brother and sister, and the result was that one of their children was blind and another deformed. For these reasons it is best not to leave the birds to choose for themselves, but to separate them before any attachment springs up between them. Cages sold as "breeding cages" have a wooden compartment at the top of one end for nest-boxes, and a wired-off partition underneath, into which the young birds may be put when it is desirable to separate them from their parents. There are some advantages in these cages, and the birds which are shy and like retirement prefer them to the open cages; the only objection to them is that they are inconveniently small when a large family is hatched, and that the nest-boxes are necessarily so high that the young birds sometimes fall, when they come out of the nest before they are fully fledged, and are injured thus. On this account we put nest-baskets into our cages, at a little distance from the floor, so that the young birds hop in and out easily; and if the old birds should entangle their feet in the nest (which they sometimes do if the claws are long and they fly out in a hurry), and the young birds are thrown out of it, they are not likely to be so much hurt as if they fell from the greater height. Breeding cages have compartments for the separate pairs, three in each, the centre space being kept for the young birds of each family, that they may be fed through the wires by the old birds, when they have left the nest, but cannot feed themselves. This space is necessary, too, to prevent quarrels, as the birds on each side of the wire partition will sometimes try to fight, and make furious assaults on their neighbors through the bars, or jealousies will arise to

break their domestic peace, if, while the hen is sitting, her husband chooses to feed his neighbor's wife through the wires. The pairs should be kept as retired and out of sight of each other as possible. The materials for the nest should be hung up in the cage in a little net; fine moss and cow-hair are best; if cotton wadding is given it is apt to get matted and clogged round the bird's claws. The hen will generally make the nest herself; but some birds are idle about it, and do not take the trouble to do more than to put a little moss or wool into the basket, and then it is as well to make a nest for her; but it is not at all certain that she will allow it to remain in the basket. Some birds seem to prefer sitting on their eggs without a nest, or are very capricious about its formation, and will undo one day the work of the previous day. It is as well to leave them to their own devices till the young are hatched, and then they may have a little moss or cow-hair put in under them to make their bed softer. The hen generally lays four or five eggs, and sits thirteen or fourteen days, unless she or her mate have a bad habit of eating the eggs. They should be left in the nest, and not touched or interfered with at all, until a fortnight has elapsed after the laying of the last egg; then, if there are no signs of hatching, the eggs may be put into warm water; if they float the probability is that they are addled, and no young bird in the egg; if they sink, they may be replaced for a day or two, but if not hatched then, they should be taken away, or the hen will go on sitting uselessly (on dead birds probably). Sometimes a violent jar, caused by the shutting of a door near the cage, or the fall of the cage itself, will kill the birds in the eggs, or the mother bird will cause their death by allowing the eggs to get cold, if sitting irregularly. The egg food must be provided in readiness for the hatching; and it is necessary to watch the birds' proceedings at first, lest they should not feed the young ones; but very few canaries are unnatural enough to leave them unfed, although they do not like to be overlooked, and, if they are shy birds, will refuse to feed their little ones when they are in sight, so that one has to watch them without appearing to do so. If they feed them once they will continue to do so; if not, it will be needful to bring them up by hand, giving them the soft egg food with a

quill, as with the nestlings before mentioned. A fresh nest must be given if the first nest becomes dirty, and the young birds carefully transferred to it with no more touching than is necessary. Some parent birds will resent any interference with their young, and will desert if they are meddled with; others will appear pleased at any notice bestowed on them, and will call our attention to their children with great exultation, chirping and flying up to the nest, looking in, and then looking up in our faces as if to say, "Pray admire my lovely infants."

If our birds are as familiar with us as they ought to be, they will exhibit their confidence in our sympathy and make their wants known to us in a very pleasant and expressive manner: if they want fresh food or water they will go down to the glasses and look into them, and then look up at us and chirp; or if anything is amiss with their nestlings, they will attract our attention to the nest by signals that cannot be mistaken. One bird who wanted materials for her nest went about the cage picking up stalks, and another pulled the hair of any human head that came within her reach, to show what she wanted.

The young birds will generally be out of the nest in about a fortnight during the day, returning to it at night for warmth. The mother bird will often begin to lay again about this time, and must have a fresh nest given her; and the young ones should be put into the nursery partition, so as to be fed through the wires (or in a small cage tied on to the larger one). They are apt to tease their mother, or to break the eggs, by jumping in and out of the nest while she is sitting. We have sometimes seen three or four little heads peeping out under her wings at once, and occasionally they will sit upon her, which in hot weather is almost too much to endure. The cock bird will feed them while she is sitting, and show them how to feed themselves. They must have a supply of egg food, crushed seed, and water in their compartment, and by degrees they will become independent of their parents. The first moulting tries the young birds' strength much, and till it is over they must have the same kind of food—egg food and crushed hemp-seed, in addition to their usual provisions. The hen should not be allowed to have more than two broods in the year, for her health's sake. If she goes on laying or sitting, the nest should

be taken away from her; and if that hint is not sufficient, she must be seperated from the cock till she begins to moult. The young birds should be within hearing of a good songster till after their moulting is over, when they will begin to warble feebly. If a nightingale or woodlark were to be had as music master, they would learn his notes; but we do not advise any one to keep these birds in confinement; they are not fitted for it by temperament or constitution, and their song is much more glad and sweet in their native woods. We had one canary who had learned several nightingale notes, and used to repeat the "jug, jug," continually; he would not sing in company with others, but taught the young birds very well from a little distance. They will often learn best when their singing-master is out of sight.

Cross-breeding has changed the canary of the present day from the original wild green bird of Teneriffe and the Canary Isles, and the varieties of shape and plumage are endless. There are canary societies and bird-shows now, and prizes are given for birds which excel in beauty or song. They are arranged in different divisions, and connoisseurs talk knowingly of "jonques," "spangles," "mealy birds," "flaxen," "grey," "cinnamon," and "agate-colored" canaries, all of which have their distinguishing merits. Then there is the German canary, a small, compact, smooth bird, with a sweet but not very powerful voice; and the Belgian, its opposite in every respect, very long and slender, with exceedingly high shoulders and long legs, standing so uprightly on its perch as to give one the idea that it would fall backwards. The Norwich, or London fancy, prize canary, is a large square bird, with a massive head, deep orange in plumage all over the body, excepting the wings and tail, which should be black. This, at least, used to be the prize bird, but every season has its fashion in birds as well as in dress. To our mind it is the most beautiful of all the canaries when perfect, but it is very difficult to get one without white or green feathers, or irregularly marked; and a perfect bird will become imperfect after its first two moults. This is the case also with the lizard canary, which should be of a greenish bronze throughout, excepting the crown of the head, which is yellow in the gold-spangled, and white in

the silver-spangled lizard. The markings or spangles on the back are very uniform and regular, and there ought to be no yellow or white feathers in the wings or tail; but these generally come when the bird is two years old.

Virginian Nightingale.—The cardinal grosbeak, or Virginian nightingale, is a very beautiful red bird, with glossy black feathers about the head and neck. It is about eight inches long, of which the tail measures three. The song is varied and constant, and continues all through the year, except while it is moulting. The hen, which is of a reddish-brown color, is said to sing nearly as well as the cock; and perhaps that is the reason why these birds are better apart—the cock is jealous of his mate's rivalry of voice. Bird dealers have so often pronounced an unfavorable opinion of the cardinal grosbeak as regards its capabilities as a domestic pet, that we were surprised to hear of one which was so exceedingly tame that he would carry his favorite tit-bits to his mistress, and try to make her eat crushed hemp and caterpillars! The bird is naturally very nervous and sensitive, so that it would fret and chafe in a shop surrounded by other birds, and its wild fluttering would give the idea that it could never be tamed; but patient kindness and gentleness will make it most attractive and pleasant pet. It should be fed chiefly on canary-seed, but should have a few hemp-seeds every day, and four or five meal-worms, or spiders, grubs, or caterpillars—some animal food, in short, to keep it well and vigorous. Spanish nuts, almonds, walnuts, and Indian corn, may be given as a treat; and a lump of basalt and a little piece of chalk should be put in the cage, and the bird should always be allowed a bath, and should be kept out of draughts. We give the directions which have been given to us by a lady whose Virginian nightingale has flourished under her judicious care many years.

Parrots.—An article on domestic pets seems scarcely complete without some notice of parrots and parakeets; but there are so many varieties of this tribe of bird, and they come from so many parts of the world, that they require a book to themselves. We can only make a few suggestions for their treatment generally. Those which are natives of tropical climates require warmth and abundance of farinaceous food and

fruit. Bread and milk should be the staple prison diet of parrots (the bread should be soaked first in boiling water, squeezed as dry as possible, and then allowed to absorb as much fresh boiled milk as it will hold), adding Indian corn, biscuits, nuts, almonds (not bitter almonds), fruit (hard and soft), peach and plum kernels, cherries, grapes, pears, &c., grain and seeds for the larger birds; and the smaller kinds should have hemp, canary, and millet seeds, with fruit. All should have water for drinking and bathing within reach; and if the birds will not go into water, it is well to sprinkle a little warm water on them occasionally, and put them into the sunshine that they may plume themselves and clean their feathers. Great cleanliness is necessary to keep parrots in health, and their feet must be frequently washed if they get dirty and they will not bathe themselves. They are subject to diseased feet, and their perches should be covered with flannel, and the bottom of the cage should have a grating with a drawer underneath it always covered with sand. Lettuce or water-cress is given to these birds occasionally; and it is said that a chili-pod given from time to time is useful—when they are moulting they may have one or two cut up small once a week. If they have an attack of asthma they should have a few grains of cayenne pepper mixed with their bread and milk. Meat, sugar, and sweetmeats, are all unwholesome for parrots.

Doves.—Doves are pretty, gentle, quiet birds, and easily tamed. The stock dove, ring dove, turtle dove, and collared turtle, are all kept in confinement, but they should all have a great deal of air. If kept in a wicker cage, it should be carried indoors at night (for, being natives of hot countries, they do not bear cold well), and taken out of doors early in the morning. The German peasants keep doves constantly in their cottages, from a fancy that they cure colds and rheumatism by taking the complaints themselves; and we believe it is true that doves are subject to the diseases which people shut up in the same room with them have, such as small-pox, swollen legs, and tumors in the feet; but this is probably due to the close, unwholesome condition and bad air of the room, which affects birds and human beings alike. They are best kept in a conservatory or aviary, unless they are tame enough to fly in and

out of the house, and return to their cages at night or when they want food, in which case they may be allowed their liberty. They must have plenty of fine, dry gravel and conveniences for bathing, and their food should be barley, wheat, peas, vetches, hemp, and canary seed. They like variety in it, and are fond of bread dry or soaked, the seeds of pines and firs, and linseed and myrtle berries. They ought to have bay salt mixed with old mortar or gravel. The salt is good for their throats, which often become diseased. Doves generally have two broods in the year, two young ones at a time, which they feed from their crops. We have been told that they are often unnatural enough to neglect this duty; but we do not think this is generally the case. The young are so dependent upon their parents, that they could hardly be reared by hand. They are not very interesting birds, but have great beauty of plumage, and no disagreeable characteristics to detract from their merits as domestic pets.

LEGAL POINTS.

Articles of Agreement.—An agreement is a contract, by which a certain person or persons, agrees or contracts to perform certain duties within a specified time. It is of much importance, in all matters, upon which may arise a difference of opinion, or misunderstanding, that contracts be reduced very explicitly to writing. Agreements should show that they are made for a reasonable consideration, otherwise they are void in law. The contract expires at the end of a year, unless it is expressly stipulated that the agreement is binding for a longer time. A signature should always be written with pen and ink, for safety, although a pencil signature is legal. Misrepresentation, or discovery of fraud, or changing of date by one party to the agreement, renders the contract void. Agreements should state explicitly, within what time its conditions are to be complied with. Always duplicate copies of an agreement, that each party may retain a copy.

Bills of Sale.—A written agreement, by which one party transfers to another, for a consideration on delivery, all his right, title, and interest, in personal property, is a bill of sale.

The ownership of personal property, in law, is not changed until the delivery, and the purchaser takes actual possession of such property, though in some States a bill of sale is prima facie evidence of ownership, even against creditors, unless the sale was fraudulently made, for the purpose of avoiding the payment of debts.

Deeds.—A deed is an instrument in writing, by which lands and appurtenances thereon are conveyed from one person to another, signed, sealed, and properly subscribed. A deed may be written or printed on parchment or paper, and must be executed by parties competent to contract.

One witness is required in New York, and two witnesses are required in Vermont, New Hampshire, Rhode Island, Connecticut, Ohio, Pennsylvania, Georgia and Indiana. Should the deed be proven by witnesses, two are also required in Tennessee, Delaware and South Carolina. In the other States no witnesses are necessary, the deed be-

ing acknowledged by a person duly authorized by law. There must be a realty to grant, and a sufficient consideration, to render a deed valid.

The following requisites are necessary to enable a person to legally convey property to another: 1st, He or she must be of sane mind; 2d, of age; and 3d, he or she must be the rightful owner of the property.

The grantor is the person who makes the deed, and the grantee, the person who receives the deed. The wife of the grantor, in the absence of any statue regulating the same, must acknowledge the deed, or else, after the death of her husband, she will be entitled to a one-third interest in the property, as dower during her life. Her acknowledgment of the deed must be of her own free will and accord, and the officer, before whom the acknowledgment is taken, must sign his name as a witness to the fact that her consent was without compulsion. Special care should be taken to have the deed properly acknowledged and witnessed, and the proper seal attached. The deed takes effect upon its delivery to the proper authorized person. Any alterations or interlineations in the deed should be noted at the bottom of the instrument, and properly witnessed. After the acknowledgment of a deed, the parties have no right to make the slightest alteration. An alteration after the acknowledgmant, in favor of the grantee, vitiates the deed.

By a general warranty deed, the grantor agrees to warrant and defend the property conveyed against all persons whatsoever. A quit claim deed releases what interest the grantor may have in the land, but does not warrant and defend against others. Deeds, upon their delivery, should be recorded in the Recorder's office without delay.

Chattel Mortgages.—A mortgage on personal property, given by a debtor to a creditor, as security for the payment of a sum that may be due, is a chattel mortgage.

The property mortgaged may remain in the possession of either party, while the mortgage is in force. In order to hold the property secure against other creditors, the mortgagee, or person holding the mortgage, must have a true copy filed in the Clerk's or Recorder's office of the place where the mortgagor, or person giving the mortgage, resides, and where the property is when mortgaged.

A justice of the peace, according to the laws of some States, in the voting precinct where such property mortgaged is located, must acknowledge and sign the mortgage, taking a transcript of the same upon his court docket, while the mortgage itself should be recorded, the same as real estate transfers.

When the person giving the mortgage retains possession of the property, he may empower the party holding the mortgage with authority to take the goods and chattels mortgaged into his possession at any time he may deem the same insufficient security for his claims; or if he shall be convinced that an effort is being made to remove such property, whereby he would be defrauded of his claim, or for other reasons, when he may deem it necessary to secure his claim, he can proceed to take

possession of it; and said property, after having given legal notice of sale, according to the law of the State governing the same, he is allowed to sell at public sale, to the highest bidder. Out of the money obtained therefrom, he can retain sufficient to liquidate his demand and defray the necessary expenses, turning over any moneys remaining to the mortgagor.

Landlord and Tenant.—No particular form of wording a lease is necessary. It is important, however, that the lease state, in a plain, straight forward manner, the terms and conditions of the agreement, so that there may be no misunderstanding between the landlord and tenant.

The lease must state all the conditions, as additional verbal promises avail nothing in law. It is held, generally, that a written instrument contains the details, and states the bargain entire, as the contracting parties intended.

The tenant can sublet a part, or all, of his premises, unless prohibited by the terms of his lease.

A lease by a married woman, even if it be upon her own property, at common law, is not valid; but, by recent statues, she, in many States, may lease her own property and have full control of the same; neither can the husband effect a lease that will bind her after his death. His control over her property continues only so long as he lives.

Neither a guardian or minor can give a lease, extending beyond the ward's majority, which can be enforced by the lessee; yet the latter is bound unless the lease is annulled.

If no time is specified in a lease, it is generally held that the lessee can retain possession of the real estate for one year. A tenancy at will, however, may be terminated in the Eastern States by giving three month's notice in writing; in the Middle and Southern States, six months; and in the Western States, one month; though recent statutes in some States have modified the above somewhat.

The lease that specifies a term of years, without giving the definite number, is without effect at the expiration of two years. A lease for three or more years, being signed by the Commissioner of Deeds, and recorded in the Recorder's office, is an effectual bar to the secret or fraudulent conveyance of such leased property; and it further obviates the necessity of procuring witnesses to authenticate the validity of the lease.

Duplicate copies of a lease should always be made, and each party retain a copy of the same.

A new lease invalidates an old one.

A landlord misrepresenting property that is leased, thereby subjecting the tenant to inconvenience and loss, such damages can be recovered from the landlord by deduction from the rent.

A lease on property that is mortgaged ceases to exist when the person holding such mortgage forecloses the same.

A landlord consenting to take a substitute, releases the first tenant.

Where there is nothing but a verbal agreement, the tenancy is understood to commence at time of taking possession. Where there is no time specified in the lease, tenancy is regarded as commencing at the time of delivering the writings. If it is understood that the tenant is to pay the taxes on the property he occupies, such fact must be distinctly stated in the lease, as a verbal promise is of no effect.

Partnerships.—An agreement between two or more persons to invest their labor, time, and means together, sharing in the loss or profit that may arise from such investment, is termed a partnership.

This partnership may consist in the contribution of skill, extra labor, or acknowledged reputation upon the part of one partner, while the other, or others, contribute money, each sharing alike equally, or in fixed proportion, in the profits, or an equal amount of time, labor, and money may be invested by the partners, and the profits equally divided; the test of partnership being the joint participation in profit, and joint liability to loss.

A partnership formed without limitation is termed a general partnership. An agreement entered into for the performance of only a particular work, is termed a special partnership; while the partner putting in a limited amount of capital, upon which he receives a corresponding amount of profit, and is held correspondingly responsible for the contracts of the firm, is termed a limited partnership, the conditions of which are regulated by statute in different States.

A partner signing his individual name to negotiable paper, which is for the use of the partnership firm, binds all the partners thereby. Negotiable paper of the firm, even though given on private account by one of the partners, will hold all the partners of the firm when it passes into the hands of holders who are ignorant of the facts attending its creation.

Partnership effects may be bought and sold by a partner; he may make contracts; may receive money; endorse, draw, and accept bills and notes; and while this may be for his own private account, if it apparently be for the use of the firm, his partners will be bound by his action, provided the parties dealing with him were ignorant of the transaction being on his private account; and thus representation or misrepresention of a partner, having relation to business of the firm, will bind the members in the partnership.

An individual lending his name to a firm, or allowing the same to be used after he has withdrawn from the same, is still responsible to third persons as a partner.

A partnership is presumed to commence at the time articles of copartnership are drawn, if no stipulation is made to the contrary, and the same can be discontinued at any time, unless a specified period of partnership is designated in the agreement; and even then he may withdraw by giving previous notice of such withdrawal from the same, being liable, however, in damages, if such are caused by his withdrawal.

Should it be desired that the executors and representatives of the partner continue the business in the event of his death, it should be so specified in the articles, otherwise the partnership ceases at death. Should administrators and executors continue the business under such circumstances, they are personally responsible for the debts contracted by the firm.

If it is desired that a majority of the partners in a firm have the privilege of closing the affairs of the company, or in any way regulating the same, such fact should be designated in the agreement; otherwise such right will not be presumed.

Partners may mutually agree to dissolve a partnership, or a dissolution may be effected by a decree of a Court of Equity. Dissolute conduct, dishonesty, habits calculated to imperil the business of a firm, incapacity, or the necessity of partnership no longer continuing, shall be deemed sufficient causes to invoke the law in securing a dissolution of partnership, in case the same cannot be effected by mutual agreement.

After dissolution of partnership, immediate notice of the same should be given in the most public newspapers, and a notice likewise should be sent to every person having special dealings with the firm. These precautions not being taken, each partner continues liable for the acts of the others to all persons who have no knowledge of the dissolution.

Wills.—The legal declaration of what a person determines to have done with his property after death, is termed a will.

All persons of sufficient age, possessed of sound mind, excepting married women in certain States, are entitled to dispose of their property by will. Children at the age of fourteen, if males, and females at the age of twelve, can thus dispose of personal property.

No exact form of words is necessary in order to make a will good at law; though much care should be exercised to state the provisions of the will so plainly that its language may not be misunderstood. The person making the will is termed the testator; if a female, a testatrix.

A will is of no force until the death of the testator, and can be cancelled or modified at any date by the maker. The last will made annuls the force of all preceding wills.

The law regards marriage and offspring resulting, as a prima facie evidence of revocation of a will made prior to such marriage, unless the wife and children are provided for by the husband in some other way, in which case the will remains in full force.

To convey real estate by will, it must be done in accordance with the law of the State where such land is located; but personal property is conveyed in harmony with the law that obtains at the place of the testator's residence.

There are two kinds of wills, namely, written or verbal, or noncupative. The latter or spoken wills, depending upon proof of persons hearing the same, generally relate to personal property only, and are

not recognized in all the States, unless made within ten days previous to the death. Verbal or unwritten wills are usually unsafe, and, even when well authenticated, often make expensive litigation; hence the necessity of having the wishes of the testator fully and clearly defined in a written will.

To give or make a devise of property by will, and subsequently dispose of the same, without altering the will to conform to such sale, destroys the validity of the entire will.

A will made by an unmarried woman is legally revoked by marriage; but she can take such legal steps in the settlement of her property, before marriage, as will empower her to dispose of the same as she may choose, after marriage.

No husband can make a will that will deprive the wife of her right of dower in the property; but the husband can will the wife a certain amount in lieu of her dower, stating it to be in lieu thereof. Such bequest, however, will not exclude her from her dower, provided she prefers it to the bequest made in the will. Unless the husband states distinctly that the bequest is in lieu of dower, she is entitled to both.

Property bequeathed must pay debts and encumbrances upon the same before its distribution can be made to the legatees of the estate.

Though property may be willed to a corporation, the corporation cannot accept such gift unless provision is made for so doing in its charter. A will may be revoked by marriage, codicil, destruction of the will, disposing of property devised in a will, or by the execution of another will.

The person making a will may appoint his executors, but no person can serve as such executor if he or she be an alien at the time of proving of the will; if he be under twenty-one years of age, a convict, a drunkard, a lunatic, or an imbecile. No person appointed as an executor is obliged to serve, but may renounce his appointment by legal written notice, signed before two witnesses, which notice must be recorded by the officer before whom the will is proved.

In case a married woman possesses property, and dies without a will, her husband is entitled to administer upon such property in preference to any one else, provided he be of sound mind.

Any devise of property made to a subscribing witness is invalid, although the integrity of the will in other respects is not affected.

In all wills the testator's full name should be made at the end of such. If he be unable to write, he may have his hand guided in making a mark against the same. If he possesses a sound mind, and is conscious at the time of the import of this action, such mark renders the will valid.

Witnesses should always write their respective places of residence after their names, their signatures being written in the presence of each other, and in the presence of the testator.

It should be stated also, that these names are signed at the request

of, and in the presence of, the testator, and in the presence of each other.

The following States require two subscribing witnesses: Missouri, Illinois, Ohio, Kentucky, Arkansas, North Carolina, Tennessee, Iowa, Utah, Texas, California, New Jersey, Delaware, Indiana, Virginia, and New York. Three witnesses are required to authenticate a will in the following States: Florida, Mississippi, Maryland, Louisiana, Georgia, South Carolina, Wisconsin, Oregon, Minnesota, Michigan, Massachusetts, Rhode Island, Connecticut, Maine, New Hampshire, and Vermont. Proof of signature of the testator, by the oath of two reputable witnesses, is sufficient to establish the validity of a will in the State of Pennsylvania, no subscribing witnesses being absolutely necessary.

Witnesses are not required to know the contents of a will. They have simply to know that the document is a will, and witness the signing of the same by the testator.

Codicils.—An addition to a will, which should be in writing, is termed a codicil. A codicil is designed to explain, modify, or change former bequests made in the body of the will. It should be done with the same care and precision as was exercised in the making of the will itself.

Exemptions from Forced Sales.—Showing property exempt from attachment, or levy and sale on execution, according to the laws of different States:

Alabama.—Home worth $2,000, and personal property to the value of $1,000.

Arkansas.—Home worth $2,500, said home being the residence of a householder, or head of family, and personal property to the value of $500.

California.—Home worth $5,000, if declaration of homestead is properly filed in the Recorder's office of the county where situate, by a husband or wife, or other head of a family, except in the following cases: 1st. Where the judgment was obtained before the declaration of homestead. 2d. On judgments for liens of mechanics, laborers, or vendors of the land. 3d. On debts secured by mortgage on the land, executed by husband and wife, or an unmarried claimant. 4th. On debts secured by mortgage on the land before the declaration of the homestead. The other exemptions are necessary household, table and kitchen furniture, including one sewing machine and piano, in use, or belonging to a woman; provisions sufficient for one month; farming utensils or implements of husbandry; also, two oxen, or horses, or mules, with harness; one wagon and food for said cattle for one month; all seed, grain, or vegetables, actually prepared for planting or sowing within the ensuing six months, not exceeding $100 in value; tools of a mechanic necessary to his trade; instruments and libraries of a professional man necessary to his profession; the cabin or dwelling of a miner

not exceeding $500 in value, together with all his tools, implements or appliances necessary for mining operations, not exceeding $500 in value, and two horses or cattle, with food for same for one month, when used for mining purposes; two horses or other cattle, with harness, and hack, carriage or cart, with which a man earns his living; and the horse, vehicle and harness, of a physician or minister of the gospel, with food for one month; four cows, with their sucking calves, and four hogs, with their sucking pigs; poultry to the value of $50; earnings of debtor for services rendered within thirty days before levy, necessary for the use of his family residing in the State, supported by his labor; shares in a homestead corporation not exceeding $1,000 in value, when the holder does not own a homestead.

Colorado.—Home worth $2,000, and to the head of a family owning and occupying the same, various articles of personal property. The tools, working animals, books and stock in trade, not exceeding $300 in value, is exempted to any person not the head of a family, when used and kept for the purpose of carrying on a business or trade, and personal property, $1,000.

Connecticut.—No home exempted. The following personal property is exempt: Necessary apparel, bedding, and household furniture; implements of the debtor's trade; one cow and ten sheep, value not to exceed $150; specified amounts of family stores, one stove, one horse, saddle and bridle, buggy and harness, to the value of $200, of any practicing physician or surgeon; one sewing machine in use, pew in church, and a library to the value of $500; one boat used in fishing to the value of $200.

Dakota.—Home of 160 acres with buildings, or one acre and house in village or city, and personal property, defined by statute, to the value of $1,500.

Delaware.—No home exempted. Personal property to the value of $275; family library, pictures, pew in church, lot in cemetery, wearing apparel of debtor and family, and tools, implements and fixtures necessary to carry on business, worth not over $75. Head of family in addition, is allowed on other personal property, not enumerated above, $200.

District of Columbia.—No home exempted. Personal property of the following value, except for servant's or laborer's wages due, are exempted: Wearing apparel; household furniture to the value of $300; fuel and provisions for three months; mechanic's tools or implements of trade to value of $200, with stock to same amount; library and instruments of a professional man to value of $300; a farmer's team and other utensils to value of $100; family pictures and library to value of $400.

Florida.—Farm, or house and lot and personal property to the value of

$1,000; and additional $1,000 worth of property is exempt from all debts incurred prior to May 10, 1865.

Georgia.—Home worth $1,600, and personal property to the value of $1,000, to be valued at the time they are set apart.

Idaho.—Home worth $5,000 to the head of a family, and furniture, teams, tools, stock, and other personal property to the value of $300, is exempt, except upon a judgment recovered for its price, or upon a mortgage thereon.

Illinois.—Home worth $1,000 to a householder, having a family. There is no exemption from sales for taxes, assessments, debt or liability incurred for the purchase or improvements of said home. No release or waiver of exception is valid unless in writing, and subscribed by said householder and wife, if he have one, and acknowledged as conveyances of real estate are acknowledged. The following personal property is exempt from execution: Writ of attachment and distress for rent; necessary wearing apparel; one sewing machine; furniture, tools, and implements necessary to carry on his trade or business, to value of $100; implements or library of any professional man to value of $100; materials and stock designed and procured for carrying on his trade or business to value of $100; and also when debtor is the head of a family, and resides with the same, necessary beds, bedding, and household furniture to value of $100; one cow, calf, two swine, one yoke of oxen, or two horses, value not exceeding $200, with the harness therefor, necessary provisions and fuel for the use of family three months, and food for herein mentioned stock for same time; the family pictures, library, cemetery lots and tombs; $100 worth of other property adapted to his condition in life, selected by the debtor. No personal property is exempt from sale for the wages of laborers or servants. Wages of a laborer, who is the head of a family, cannot be garnisheed, except the sum due him be in excess of $25.

Indiana.—Home to the amount of $300, and personal property to like amount. No property shall be sold by virtue of an execution for less than two-thirds its appraised cash value, unless this provision is waived in contract.

Iowa.—Farm of 40 acres, or house and lot in city, provided the same is used for a home, and to value of $500. All wearing apparel kept for actual use and suitable to the condition of the party, trunks and other receptacles to hold the same; one musket or rifle; the proper tools, instruments, or books, of any farmer, mechanic, surveyor, clergyman, lawyer, physician, teacher, or professor; the horse or the team, consisting of not more than two horses or mules, or two yoke of cattle, and the wagon or other vehicle, with the proper harness or tackle, by use of which any physician, public officer, farmer, teamster or other laborer habitually earns his living; private library, pictures, and paintings. If the debtor

is the head of a family, there is further exempt: One cow, one calf, horse, fifty sheep and the wool therefrom, five hogs and all pigs under six months; the necessary food for animals exempt for sixty days; all flax raised by the defendant and the manufactures therefrom; bed and bedding necessary; all cloth manufactured by the defendant not exceeding 100 yards in quantity; household and kitchen furniture to the value of $200; all spinning wheels and looms, and other instruments of domestic labor kept for actual use; the necessary provisions and fuel for family use for six months. The word family does not include strangers or boarders; the earnings of such debtor for personal services, or those of his family at any time within ninety days next preceding the levy. None of the foregoing exemptions are for the benefit of a single man not the head of a family, or of a non-resident, nor of those who have started to leave the State, but their property is liable to execution, with the exemption in the two former cases of ordinary wearing apparel and trunks; and in the latter case of such wearing apparel and property as the defendant may select, not to exceed $75, to be selected by the debtor and appraised; but any person coming to the State with the intention of remaining, is a resident.

Kansas.—Home of 160 acres of farm land, or house and one acre in city or town, provided it is used as a residence by the family of the owner, together with all the improvements. The value is not limited. No personal property is exempt for the wages of a servant, mechanic, laborer, or clerk. The following personal property is exempt to heads of families: Library, pictures, and musical instruments used by the family. All wearing apparel, beds and bedding used by the family; one cooking stove and appendages, and all cooking utensils, together with all other stoves and appendages necessary for use of family; one sewing machine, spinning wheel, and all other household furniture, not exceeding in value $500; two cows, ten hogs, one yoke of oxen, and one horse or mule, or in lieu of one yoke of oxen and one horse or mule, a span of horses or mules, and twenty sheep and their wool; necessary food for the support of the stock for one year; one wagon, two plows, drag and other farming utensils, not exceeding in value $300; food for the family for one year; the tools and implements of any mechanic, miner, or other person, kept for the purpose of carrying on his business, and in addition thereto stock in trade not exceeding $400 in value; library, implements, and office furniture of any professional man.

Kentucky.—Home not exceeding in value $1,000, and the following personal property: Wearing apparel and the usual household and kitchen furniture, to the value of $100; one work beast or yoke of oxen, two cows and calves, and five sheep; one sewing machine.

Louisiana.—Home of 160 acres of land, and personal property in all to the value of $2,000; must be occupied as a residence, and *bona fide* owned by the debtor, having a family, a person or persons depending upon him for support.

Maine.—Home worth $500; necessary apparel and bed and bedding for every two members of the family; one cooking stove, all stoves used for warming buildings, and other necessary furniture to value of $50; one sewing machine; all tools necessary for the debtor's occupation; library not exceeding in value $150; one cow, one heifer, ten sheep and the wool and lambs from same, two swine, one pair of working cattle, or in lieu thereof one pair of mules, or two horses, not exceeding in value $300; all produce of farms until harvested; corn and grain for use of family not exceeding thirty bushels; all potatoes raised or purchased for family use; one barrel of flour, and enough hay to winter all exempted stock; all flax raised on one half acre for use; lumber to the amount of $10; twelve cords of fire-wood, five tons of anthracite coal, fifty bushels of bituminous coal, and all charcoal for use in family; one church pew; one horse sled to value of $20; one harness worth $20 for each horse or mule; one cart or truck-wagon, one harrow, one plow, one yoke, two chains, and one mowing machine; for fishermen, one boat not exceeding two tons burden.

Maryland.—No home exempted. The personal property exempted is that which is actually necessary for the sustenance of the family, the tools or implements that are necessary to earn a livelihood, and, wearing apparel, $100.

Massachusetts.—Home worth $800, to a man having a family and occupying the same as a home; the necessary wearing apparel, bed and bedding; stove to value of $50; sewing machine in actual use, and other household furniture necessary for use of family to the value of $300; library to the value of $50; one cow, six sheep, one swine, and two tons of hay; implements, tools and fixtures necessary to the carrying on of his trade or business, to value of $100; materials and stock designed and procured by him, and necessary for carrying on his trade or business, to value of $100; necessary provisions for family to value of $50; the boat, fishing tackle, and nets of fishermen, actually used in their business, to value of $100; uniform and arms of a soldier required by law.

Mississippi.—Home of 80 acres of land to the head of a family being a housekeeper; or in town or city, real estate to the value of $2,000, when used as a homestead; personal property.

Missouri.—Homestead to married men of 160 acres of land, to value of $1,500. In cities of 40,000 inhabitants and over homestead shall not include more than eighteen square rods of ground, nor exceed in value $3,000. Personal property to the value of not less than $300 to heads of families.

Michigan.—Homestead in country not exceeding 40 acres, or in city or town not exceeding one lot, occupied as a residence, and not exceeding in value $1,500; household furniture to value of $250; stock in

trade, a team, or other things necessary to carry on a particular business, to value of $250; library to value of $150; to a householder, ten sheep, two cows, five swine, and some minor things.

Minnesota.—Home of 80 acres of farm land, or house and lot in city or town, same used as a homestead. In personal property, the pictures, library, and musical instruments; wearing apparel, beds and bedding used by family; stoves and appendages, cooking utensils and other household furniture used by family, and not exceeding in value $500; three cows, two swine, one yoke of oxen and a horse, or instead of oxen and a horse, a span of horses or mules, twenty sheep and the wool from the same, either in raw material or manufactured; the necessary food for exempted stock for one year; one wagon, cart or dray; one sleigh, two plows, one drag, and other farming utensils, including tackle for teams, not exceeding in value $300; necessary fuel and provisions for debtor and family for one year; the tools and instruments of any one, used and kept for the purpose of carrying on his trade, and in addition thereto stock in trade not exceeding in value $400; library and implements of any professional man; one sewing machine and earnings of minor children. No articles of personal property are exempt from execution for the purchase money thereof. All articles to be chosen by debtor or representative.

Montana.—Homestead of 80 acres, or if in city or town, one-quarter acre, not to exceed in value $2,500. The lien of a mechanic, laborer, or mortgage lawfully obtained upon the same, is not affected by such exemption. Personal property in addition, to the value of $1,400 or more, according to the value of articles, enumerated by statute, is allowed to the householder, occupying the same.

Nebraska.—Homestead of 160 acres of farm land, dwelling-house and appurtenances worth $500, to be selected by the owner, or at his option, two contiguous lots within an incorporated city or town, or twenty contiguous acres of land within the limits of an incorporated city or town, when not laid off into streets, blocks, or lots, and when owned and occupied by the owner, being a resident, and the head of a family. When not owning houses or land, the head of a family is exempt in personal property to the value of $500. Other personal property is exempt, and is enumerated by statute.

Nevada.—Home worth $5,000 to a head of family, and a debtor has exempt in personal property to the value of $1,500, enumerated by statute.

New Hampshire.—Homestead to the value of $500; necessary apparel bedding, household furniture to the value of $100; library to the value of $200; one cow, one hog, one pig, and pork of same when slaughtered; tools of occupation to the value of $100; six sheep and their fleece; one cooking stove and its furniture; provisions and fuel to the amount of

$50; one sewing machine; beasts of the plow, not exceeding one yoke of oxen, or a horse, and of hay, four tons.

New Jersey.—Home worth $1,000, when occupied by owner as a residence, being a householder, and having a family. Personal property to the value of $200, owned by a resident head of family, appraised by three persons appointed by the sheriff. Widow or administrator may claim exemption of $200.

New York.—Homestead to the value of $1,000 when owned and occupied by debtor, being a householder and having a family. In addtion to the household articles usually enumerated as exempt, and the tools of a mechanic to the value of $25, there are exempted necessary household furniture and working tools; team, and food for same for a period of ninety days; professional instruments, furniture and library, owned by any person being a householder or having a family for which he provides, to the value of $250; one sewing machine. Such exemptions do not apply to any execution issued on a demand for purchase money of any article herein enumerated by law; nor to any judgment rendered for a claim accruing for work and labor, performed in a family as a domestic; nor to any judgment obtained in any court in the city of New York, for work, labor, or services done or performed by any female employee, when such amount does not exceed the sum of $15, exclusive of costs.

New Mexico.—Home to the value of $1,000 in farm, if head of a family resides on same; wearing apparel, beds and bedding necessary for use of family, and firewood sufficient for thirty days, when intended to be used as such; library, and family and religious pictures; provisions to the amount of $25; kitchen furniture to value of $10, both to be selected by debtor; tools and implements necessary to carry on his trade or business, whether agricultural or mechanical, to be selected by him, and not to exceed in value $20. Real estate when sold must first be appraised by two freeholders of the vicinity and must bring two-thirds of the appraised value.

North Carolina.—Homestead to the value of $1,000, when used as such, and to be selected by the owner; or instead, one lot and houses thereon in a city or town, owned and occupied by any resident of the State. Personal property to the value of $500.

Ohio.—Family homestead, $1,000 in value; wearing apparel, beds and bedding necessary for the use of family; stove, pipe, and fuel sufficient for sixty days. If debtor owns no homestead, he is entitled to exemption on personal property to value of $500, in addition to the above.

Oregon.—Books, pictures, and musical instruments to the value of $75; wearing apparel to $100 in value, and if a householder, $50 worth of wearing apparel for each member of the family; tools, implements,

team, vehicle, harness, library, or apparatus, when necessary in his occupation or profession, to the value of $400; if a householder, ten sheep, with one year's fleece, two cows, five swine, household goods, furniture, and utensils to value of $300. No article of property is exempt from execution issued upon judgment for purchase price.

Pennsylvania.—Property, either real or personal, to $300 in value. The exemption may be waived in contract or note.

Rhode Island.—Home not exempted. Household furniture and stores of a housekeeper to the value of $300; wearing apparel necessary for the use of family; necessary books, etc., to $200; one cow, one hog, and tools or implements necessary for debtor's profession to the value of $50.

South Carolina.—Homestead to the value of $1,000. Household furniture, beds, bedding, family library, arms, carts, wagons, farming implements, tools, cattle, work animals, swine, goats and sheep, to the aggregate value of $500; wearing apparel necessary.

Tennessee.—Homestead to the value of $1,000, and personal property.

Texas.—Homestead to the value of $5,000, when used as such, and any subsequent increase in value of same, either in city or country. Household and kitchen furniture. To every citizen not the head of a family, one horse, saddle, and bridle; all wearing apparel, and tools, books, and apparatus of his trade or profession; also, five cows, twenty hogs, one year's provisions, and in case of death of husband there is set aside by the court, for the benefit of the widow and children, other money or property to the value of the foregoing exemptions, if the specified articles are not already exempted.

Utah.—Home worth $1,000 to head of family, same to be selected by him, and personal property to the value of $700 or more, according to the value of articles exempt by statute; each member of the family is allowed $250 aside from the homestead. No property shall be exempt from sale on a judgment received from its price, on a mechanic's lien, or a mortgage thereon.

Vermont.—Homestead to the value of $500 and products; suitable wearing apparel, bedding, tools, arms, and articles of furniture as may be necessary for upholding life; one sewing machine, one cow, the best swine, or the meat of one swine; ten sheep and one year's product of said sheep, in wool, yarn, or cloth; forage sufficient for keeping exempted cattle through one winter; ten cords of firewood, twenty bushels of potatoes; military arms required by law; all growing crops, ten bushels of grain, one barrel of flour, three swarms of bees, and hives, together with their produce in honey; two hundred pounds of sugar, and all lettered gravestones; all books used in a family; one pew in church; live

poultry to value of $10; professional books and instruments of physicians, clergymen, and attorneys at law, to value of $200; one yoke of oxen, or steers, or two horses, as the owner may choose, kept and used for team work, to the value of $300, with sufficient forage for the same through winter.

Virginia.—Home and personal property, including money and debts due him, to the value of $2,000, to a head of family, same to be selected by himself. Personal property exempted is defined by statute.

Washington Territory.—Homestead to the value of $1,000 and personal property.

West Virginia.—Homestead to the value of $1,000, where the property of that value is devised or granted by debtor, being a husband or parent, and resident in the State; and when he, previous to contracting the debt or liability, has placed a declaration of his intention to keep the property as a homestead on the land records of the county in which the real estate is situate. Also personal property to value of $500, provided debtor is a resident and parent.

Wisconsin.—Farm of 40 acres, used for agricultural purposes, and the house and appurtenances, to be selected by owner, and not included in any village, town or city; or instead, one-fourth acre of land in a village, town, or city, with dwelling house thereon, when owned and occupied by a resident of the State. Family library and pictures; wearing apparel of debtor and family; all stoves, cooking utensils, and household furniture to value of $200; two cows, ten swine, one yoke of oxen and one horse, or a span of horses or mules; ten sheep and the wool from the same, either raw or manufactured; necessary food for exempted stock for one year's support; one wagon, cart or dray, one sleigh, one plow, one drag, and other farming utensils, including tackle for teams, to value of $50; provisions and fuel for one year; tools and implements, or stock in trade of a mechanic or miner, or other person, to value of $200; library or implements of any professional man to the value of $200; all moneys from insurance of exempt property; earnings of all persons for sixty days next preceeding the issuing of any process; all sewing machines kept for use; any articles presented by Congress or the members thereof.

Wyoming.—Homestead to the value of $1,500 and personal property.

Forms of Notes.

Negotiable Without Indorsement.

$100. NEW YORK, Sept. 2, 1883.

Ninety days after date I promise to pay Leonard Smith, or bearer, One Hundred Dollars, value received. H. B. MCINTYRE.

Negotiable only by Indorsement.

$100. NEW YORK, Sept. 2, 1883.

Ninety days after date I promise to pay Leonard Smith, or order, One Hundred Dollars, value received. H. B. McINTYRE.

Not Negotiable.

$100. NEW YORK, Sept. 2, 1883.

Ninety days after date I promise to pay Leonard Smith One Hundred Dollars, value received. H. B. McINTYRE.

Payable on Demand.

$100. NEW YORK, Sept. 2, 1883.

On demand I promise to pay H. C. Spencer, or bearer, One Hundred Dollars, value received. JOHN THOMAS.

Principal and Surety.

$345.40. FLINT, MICH., Dec. 4, 1883.

Three months after date I promise to pay L. L. Walker, or order, Three Hundred, Forty-five and 40-100 Dollars, with interest, value received. FRANK STONE, Principal.

JAY C. WORCESTER, Surety.

Payable at Bank.

$200. NEW YORK, Oct. 8, 1883.

Ninety days after date I promise to pay H. W. Fairbanks, or order, at the Park National Bank, Two Hundred Dollars, value received.

WHEAT HOWARD.

Receipts—On Account.

$500. CHICAGO, April 25, 1883.

Received of H. B. McIntyre, Five Hundred Dollars on account.

FIELD, LEITER & Co.

In Full of all Demands.

$300. NEW YORK, April 15, 1883.

Received of S. S. Pierce, Three Hundred Dollars in full of all demands to date. CHAS. FELLOWS.

Receipt for Rent.

$300. DETROIT, Aug. 8, 1883.

Received from John D. Brown, Three Hundred Dollars, being amount in full for one quarter's rent of store, No. 65 Woodward avenue, for quarter ending Sept. 30. A. H. STEVENS.

A Short Building Contract.

CONTRACT for building made this.....day of.....one thousand eight hundred and....by and between.....of.....in the County of .....and.....of.....in the County of.....builder.

The said.....covenant and agrees to and with the said..... to make, erect, build, and finish, in a good, substantial, and workmanlike manner.....upon.....situate.....said.....to be built agreeable to the draught, plans, explanation, or specifications, furnished, or to be furnished to said.....by.....of good and substantial materials; and to be finished complete on or before the .....day of..... And said.....covenant and agrees to pay to said.....for the same. .....dollars as follows:..... ..... Security against mechanics', or other lien, is to be furnished by said .....prior to..... ..payment by said.....

And for the performance of all and every the articles and agreements above mentioned, the said.....and.....do hereby bind themselves, their heirs, executers, and administrators, each to the other in the penal sum of.....dollars, firmly by these presents.

IN WITNESS WHEREOF, We, the said.....and.....have hereunto set our hands the day and year first above written.

(*Signatures.*) (*Seals.*)

Executed and delivered in the presence of

Power of Attorney in a Short Form.

KNOW ALL MEN BY THESE PRESENTS, That I (*name of principal*), have made, constituted, and appointed, and by these presents do make, constitute, and appoint (*name of attorney*), my true and lawful attorney, for me and in my name, place, and stead to (*here describe the thing to be done*), giving and granting unto my said attorney full power and authority to do and perform all and every act and thing whatsoever requisite and necessary to be done in and about the premises, as fully, to all intents and purposes, as I might or could do if personally present, with full power of substitution and revocation; hereby ratifying and confirming all that my said attorney or his substitute shall lawfully do or cause to be done by virtue hereof.

IN WITNESS WHEREOF, I have here unto set my hand and seal, the .....day of.....in the year one thousand eight hundred and .....

(*Signature.*) (*Seal.*

Executed and delivered in the presence of

Bill of Sale of Personal Property.

KNOW ALL MEN BY THESE PRESENTS, That I.....(*name of the seller*), in the County of.....for and in consideration of the sum of.....

to.....in hand well and truly paid, at or before signing, sealing, and delivery of these presents by.....(*name of the buyer*) the receipt whereof I, the said.....do hereby acknowledge, have granted, bargained and sold, and by these presents do grant, bargain and sell unto the said.....(*name of buyer*) the following articles of personal property, to wit: (*describe property sold*).

To Have and to Hold the said granted and bargained goods and chattels, unto the said.....heir, executors, administrators and assigns, to.....only proper use, benefit, and behoof forever, and .....the said.....does vouch himself to be the true and lawful owner of the goods and effects hereby sold, and to have in himself full power, good right, and lawful authority to dispose of the said..... in manner as aforesaid, and I do, for myself, my heirs, executors and administrators, hereby covenant and agree to warrant and defend the title of said goods and chattels hereby sold unto the said..... heirs, executors and administrators, and assigns against the lawful claims and demands of all persons whatsoever:

In Witness Whereof, ...the said.....have hereunto set .....hand and seal this.....day of.....in the year of our Lord, one thousand eight hundred and.....

Executed and delivered
in presence of (*Signature.*) (*Seal.*)

Mortgage of Personal Property.

I,... .....of.....in consideration of....dollars to me paid by.....of....., convey to said..... the following personal property, to wit: (*or if the goods are too numerous to be recited, say the goods and chattels mentioned in the schedule hereto annexed*), and now in the....., in the town (*city*) of..... .....aforesaid.

To hold the afore granted goods and chattels to the said..... ....and his assigns forever.

And I covenant, that I am the lawful owner of said goods and chattels, and have good right to dispose of the same in the manner aforesaid.

Provided, nevertheless, that if the said.....pay to the said.....or his assigns the sum of.....dollars in..... from date, with interest on said sum at the rate of.....per cent. per annum, payable....., then this deed, as also a certain note of even date with these presents, given by said.....to said .....or order, to pay the said sum and interest at the times aforesaid, shall be void.

In Witness Whereof, I hereto set my hand and seal, this.....day of .....in the year of our Lord one thousand eight hundred and.....

Executed and delivered ..... [L. S.]
in presence of [L. S.]

A Chattel Mortgage, with Power of Sale.

KNOW ALL MEN BY THESE PRESENTS, That I (*name of mortgagor*), of .....in the County of.....and State of..... ....., in consideration of .....dollars, to me paid by (*name of mortgagee*) of the town (*or city*) of.....in the county of .....and State of....., the receipt whereof is hereby acknowledged, do hereby grant, bargain, and sell unto the said .....and his assigns, forever, the following goods and chattels, to wit:

(*Here insert an accurate list and full description of the articles mortgaged.*)

TO HAVE AND TO HOLD, all and singular, the said goods and chattels unto the mortgagee herein, and his assigns, to their sole use and behoof for ever. And the mortgagor herein, for himself and his heirs, executors, and administrators, does hereby covenant to and with the said mortgagee and his assigns, that said mortgagor is lawfully possessed of the said goods and chattels, as of his own property; that the same are free from all encumbrances, and that he will warrant and defend the same to him the said mortgagee and his assigns, against the lawful claims and demands of all persons.

PROVIDED, NEVERTHELESS, That if the said mortgagor shall pay to the mortgagee, on the .....day of .....in the year.....the sum of.....dollars, then this mortgage is to be void, otherwise to remain in full force and effect.

AND PROVIDED FURTHER, That until default be made by the said mortgagor in the performance of the condition aforesaid, it shall and may be lawful for him to retain the possession of the said goods and chattels and to use and enjoy the same; but if the same or any part thereof shall be attached or claimed by any other person or persons at any time before payment, or the said mortgagor, or any other person or persons whatever, upon any pretense, shall attempt to carry off, conceal, make way with, sell, or in any manner dispose of the same or any part thereof, without the authority and permission of the said mortgagee or his executors, administrators, or assigns, in writing expressed, then it shall and may be lawful for the said mortgagee, with or without assistance, or his agent or attorney, or his executors, administrators, or assigns, to take possession of said goods and chattels, by entering upon any premises wherever the same may be, whether in this County or State, or elsewhere, to and for the use of said mortgagee or his assigns. And if the moneys hereby secured, or the matters to be done or performed, as above specified, are not duly paid, done or performed at the time and according to the conditions above set forth, then the said mortgagee, or his attorney or agent, or his executors, administrators, or assigns, may by virtue thereof, and without any suit or process, immediately enter and take possession of said goods and chattels, and sell and dispose of

the same at public or private sale, and after satisfying the amount due, and all expenses, the surplus, if any remain, shall be paid over to said mortgagor or his assigns. The exhibition of this mortgage shall be sufficient proof that any person claiming to act for the mortgagee is duly made, constituted, and appointed agent and attorney to do whatever is above authorized.

In Witness Whereof, The said mortgagor has hereunto set his hand and seal this.....day of.....in the year of our Lord one thousand eight hundred and....

Executed and delivered (*Signature of Mortgagor.*) [*Seal.*]
In presence of ..... [*Seal.*]

State of.....
.....County. } ss,

This mortgage was acknowledged before me, by.....(*the mortgagor*), this.....day of.....A. D. 18....

Mortgage Deed, with Power of Sale, and Release of Dower and Homestead.

This indenture made the.....day of....., in the year one thousand, eight hundred and....., between.....of....., of the first part, and.....of....., of the second part, *witnesseth*, that the said party of the first part, in consideration of..... dollars to him paid, the receipt whereof is hereby acknowledged, hath granted, bargained, sold, released, and conveyed, and by these presents does grant, bargain, sell, release, and convey to the said party of the second part, and his heirs and assigns forever, all that (*here describe property*), with all hereditaments and appurtenances thereto appertaining.

To have and to hold the said premises, with the appurtenances to said party of the second part, his heirs and assigns, to his and their use and behoof forever. Provided always, and these presents are upon condition, that if said party of the first part, his heirs or assigns, shall pay to the said party of the second part, his executors, administrators, or assigns, the sum of.....dollars, on or before the.....day of.....in the year....., with interest, according to the condition of a bond (*or note*) of the said.....to the said..... ....., bearing even date herewith, then these presents shall be void.

But upon any default in the payment of the money above mentioned, or of the interest thereon, said grantee, his executors, administrators or assigns, may sell the above granted premises with all improvements that may be thereon, at public auction in said....., first publishing a notice of the time and place of sale once each week for three successive weeks, in one or more newspapers published in said.....; and in his or their own name or names as the attorney of the said grantor, may convey the same by proper deed or deeds to the purchaser or purchasers, absolutely and in fee simple; and such sale shall forever bar the grantor, and all persons claiming under him, from all right and

interest in the granted premises, whether at law or in equity. And out of the money arising from such sale, the said grantee or his representatives shall be entitled to retain all sums then secured by this deed, whether then or thereafter payable, including all costs, charges, and expenses incurred or sustained by reason of any failure or default, on the part of the said grantor or his representatives, to perform and fulfill the condition of this deed, or any covenants or agreements herein contained: rendering the surplus, if any, together with an account of such costs, charges, and expenses, to the said grantor, his heirs or assigns.

And it is agreed, that said grantee, his administrators, executors, or assigns, or any person or persons in his or their behalf, may purchase at any sale made as aforesaid, and that no other purchaser shall be answerable for the purchase money; and that, until default in the performance of the condition of this deed, the grantor and his heirs and assigns may hold and enjoy the granted premises and receive the rents and profits thereof.

And, for the consideration aforesaid, I, M. B., wife of the said A. B., do hereby release unto the said grantee and his heirs and assigns, all right of both dower and homestead in the granted premises.

In witness whereof, the parties to these presents have hereunto set their hands and seals this day and year above written.

A. B. [L. S.]
M. B. [L. S.]

Signed, sealed, and delivered
In presence of
[Witnessed and acknowledged like any other deed.]

Form of a Will.

In the name of God. Amen I, ..., of the town of ..... in the county of....., and State of....., being of sound mind and memory (blessed be Almighty God for the same!) do make and publish this my last will and testament.

I give and bequeath to my sons,....., eight hundred dollars each, if they shall have attained the age of twenty-one years before my decease; but if they shall be under the age of twenty-one at my decease, then I give to them one thousand dollars each, the last mentioned sum to be in place of the first mentioned.

I give and bequeath to my beloved wife....., all my household furniture, and all the rest of my personal property, after paying from the same the several legacies already named, to be hers forever; but if there should not be at my decease sufficient personal property to pay the aforesaid legacies, then so much of my real estate shall be sold as will raise sufficient money to pay the same.

I also give, devise and bequeath to my beloved wife,.....all the rest and residue of my real estate, as long as she shall remain unmarried, and my widow; but on her decease or marriage, the

remainder thereof I give and devise to my said children and their heirs, respectively, to be divided in equal shares between them.

I do nominate and appoint my beloved wife, ..., to be the sole executrix of this my last will and testament.

In Testimony Whereof, I hereunto set may hand and seal, and publish and decree this to be my last will and testament, in presence of the witnesses named below, this.....day of....., in the year of our Lord, one thousand eight hundred and....

[L. S.]

Signed, sealed, declared and published by the said.....as and for his last will and testament, in presence of us, who, at his request and in his presence, and in presence of each other, have subscribed our names as witnesses hereto.

.....residing at.....in.....county.

.....residing at.....in.....county.

USEFUL TABLES.

Table showing the square feet and the feet square of the fractions of an acre.

Fractions of an acre.	Square feet.	Feet square.	Fractions of an acre.	Square feet.	Feet Square.
1-16	2722½	52⅛	½	21780	147½
⅛	5445	73¾	1	43560	208¼
¼	10890	104½	2	87120	295¼
⅓	14520	120½			

Table showing the number of hills or plants on an acre of land, for any distance apart, from 10 *inches to* 6 *feet—the lateral and longitudinal distances being unequal.*

	10 in.	12 in.	15 in	8 in	20 in	2 ft.	2½ ft	3 ft.	3½ ft	4 ft.	4½ ft	5 ft.	5½ ft	6 ft.
10 in.	62626													
12 "	52272	43560												
15 "	41817	34848	27878											
18 "	34848	29040	23232	19360										
20 "	31363	26136	20908	17424	15681									
2 feet	26136	21780	17424	14520	13068	10890								
2½ "	20908	16424	13939	11616	10454	8712	6969							
3 "	17424	14520	11616	9680	8711	7260	5808	4840						
3½ "	14935	12446	9953	8197	7467	6223	4976	4148	3565					
4 "	13068	10890	8712	7260	6534	5445	4356	3630	3111	2722				
4½ "	11616	9680	7744	6453	5808	4840	3872	3226	2767	2420	2151			
5 "	10454	8712	6969	5808	5227	4356	3484	2904	2489	2178	1936	1742		
5½ "	9504	7920	6336	5280	4752	3960	3168	2640	2263	1980	1760	1584	1440	
6 "	8712	7260	5808	4840	4356	3630	2904	2420	2074	1865	1613	1452	1320	1210

Table showing the number of plants, hills, or trees contained in an acre at equal distances apart, from 3 inches up to 66 feet.

Distance apart.	No. of plants.	Distance apart.	No. of plants.
3 inches by 3 inches	696,960	6 feet by 6 feet	1,210
4 " by 4 "	392,040	6½ " by 6½ "	1,031
6 " by 6 "	174,240	7 " by 7 "	881
9 " by 9 "	77,440	8 " by 8 "	680
1 foot by 1 foot	43,560	9 " by 9 "	537
1½ feet by 1½ feet	19,360	10 " by 10 "	436
2 " by 1 foot	21,780	11 " by 11 "	360
2 " by 2 feet	10,890	12 " by 12 "	302
2½ " by 2½ feet	6,960	13 " by 13 "	257
3 " by 1 foot	14,520	14 " by 14 "	222
3 " by 2 feet	7,260	15 " by 15 "	193
3 " by 3 feet	4,840	16 " by 16 "	170
3½ " by 3½ feet	3,555	16½ " by 16½ "	160
4 " by 1 foot	10,890	17 " by 17 "	150
4 " by 2 feet	5,445	18 " by 18 "	134
4 " by 3 feet	3,630	19 " by 19 "	120
4 " by 4 feet	2,722	20 " by 20 "	108
4½ " by 4½ feet	2,151	25 " by 25 "	69
5 " by 1 foot	8,712	30 " by 30 "	48
5 " by 2 feet	4,356	33 " by 33 "	40
5 " by 3 feet	2,904	40 " by 40 "	27
5 " by 4 feet	2,178	50 " by 50 "	17
5 " by 5 feet	1,742	60 " by 60 "	12
5½ " by 5½ feet	1,417	66 " by 66 "	10

Table showing the quantity of garden seeds required to plant a given space.

Designation.	Space and quantity of seeds.
Asparagus	1 oz. produces 1000 plants, and requires a bed 12 feet square.
" Roots	1000 plant a bed 4 feet wide, 225 feet long.
Eng. Dwarf Beans.	1 quart plants from 100 to 150 feet of row.
French "	1 " " 250 or 350 of row.
Beans, pole, large.	1 " " 100 hills.
" " small.	1 " " 300 " or 250 feet of row.
Beets	10 lbs. to the acre; 1 oz. plants 150 feet of row.
Broccoli and Kale.	1 oz. plants 2500 plants, and requires 40 square feet of ground.
Cabbage	Early sorts same as broccoli, and require 60 square feet of ground.
Cauliflower	The same as cabbage.
Carrot	1 oz. to 150 of row.
Celery	1 oz. gives 7000 plants, and requires 8 square feet of ground.
Cucumber	1 oz. for 150 hills.
Cress	1 oz sows a bed 16 feet square.
Egg Plant	1 oz. gives 2000 plants.
Endive	1 oz. " 3000 " and requires 80 feet of ground.
Leek	1 oz. " 2000 " " 60 " "
Lettuce	1 oz. " 7000 " " seed bed of 120 feet.
Melon	1 oz. for 120 hills.
Nasturtium	1 oz. sows 25 feet of row.
Onion	1 oz. " 200 " "
Okra	1 oz. " 200 " "
Parsley	1 oz. " 200 " "
Parsnip	1 oz. " 250 " "
Peppers	1 oz. gives 2500 plants.
Peas	1 quart sows 120 feet of row.
Pumpkin	1 oz. to 50 hills.
Radish	1 oz. to 100 feet.
Salsify	1 oz. to 150 " of row.
Spinage	1 oz. to 200 " "
Squash	1 oz. to 75 hills.
Tomato	1 oz gives 2500 plants, requiring seed bed of 80 feet.
Turnip	1 oz to 2000 feet.
Water Melon	1 oz. to 50 hills.

Table showing the quantity of seed required to the acre.

Designation.	Quantity of seed.	Designation.	Quantity of seed.
Wheat	1¼ to 2 bush.	Broom Corn	1 to 1½ bush.
Barley	1½ to 2½ "	Potatoes	5 to 10 "
Oats	2 to 4 "	Timothy	12 to 24 quarts.
Rye	1 to 2 "	Mustard	8 to 20 "
Buckwheat	¾ to 1½ "	Herd Grass	12 to 16 "
Millet	1 to 1½ "	Flat Turnip	2 to 3 lbs.
Corn	¼ to 1 "	Red Clover	10 to 16 "
Beans	1 to 2 "	White Clover	3 to 4 "
Peas	2½ to 3½ "	Blue Grass	10 to 15 "
Hemp	1 to 1½ "	Orchard Grass	20 to 30 "
Flax	½ to 2 "	Carrots	4 to 5 "
Rice	2 to 2½ "	Parsnips	6 to 8 "

Table showing the quantity per acre when planted in rows or drills.

Broom Corn	1 to 1½ bush.	Onions	4 to 5 lbs.
Beans	1½ to 2 "	Carrots	2 to 2½ "
Peas	1½ to 2 "	Parsnips	4 to 5 "
		Beets	4 to 6 "

Table showing the number of seeds in one pound, and weight per bushel.

NAME.	No. of Seeds per lb.	No. lbs. per bu.
Wheat	10,500	58 to 64
Barley	15,400	48 to 56
Oats	20,000	38 to 42
Rye	23,000	56 to 60
Vetches	8,300	60 to 63
Lentils	8,200	58 to 60
Beans	600 to 1,300	60 to 65
Peas	1,800 to 2,000	60 to 65
Flax seed	108,000	50 to 60
Turnip seed	155,000	50 to 56
Rape seed	118,000	50 to 56
Mustard (white)	75,000	57
Cabbage seed	128,000	52
Mangel-wurzel	24,600	20 to 24
Parsnip seed	97,000	14
Carrot seed	257,000	9
Lucern seed	205,000	58 to 60
Clover (red)	249,600	60 to 63
" (white)	686,400	59 to 62
Rye-grass (perennial)	334,000	20 to 28
" (Italian)	272,000	13 to 18
Sweet vernal grass	923,000	8

VALUE OF FOOD FOR DOMESTIC ANIMALS.

The figures below give the comparative number of pounds of each substance to equal in effect that of any standard food—as, for instance, that of hay.

Good Hay, to give a certain nourishment, requires			100 pounds.
Good Clover Hay will give same effect by the use of			95 "
Rye Straw	"	"	355 "
Oat Straw	"	"	220 "
Potatoes	"	"	195 "
Carrots	"	"	280 "

Beets will give same effect by the use of			346 pounds.
Ruta Bagas	"	"	262 "
Wheat	"	"	43 "
Peas	"	"	44 "
Beans	"	"	46 "
Rye	"	"	49 "
Barley	"	"	51 "
Indian Corn	"	"	56 "
Oats	"	"	59 "
Buckwheat	"	"	64 "
Oil Cake	"	"	64 "

CONSUMPTION OF HAY.

The hay consumed by different animals does not vary greatly from three pounds daily for each hundred pounds weight of the animals. The following table is the result of various experiments by different persons, and will be useful for farmers who wish to determine by calculation beforehand, how their hay will hold out for the winter; 500 cubic feet of timothy hay, in a full bay, being about one ton:

Working Horses	3.08 pounds.	Steers	2.84 pounds.
Working Oxen	2.40 "	Dry Cows	2.42 "
Milk Cows (Boussingault's)	2.25 "	Pigs (estimated)	3.00 "
Milk Cows (Lincoln's)	2.40 "	Sheep	3.00 "
Young Growing Cattle	3.08 "		

All the articles enumerated in these food tables are estimated as of good quality. If the fodder be of poor quality, more must be allowed.

WEIGHT OF A CUBIC FOOT

of various substances, from which the bulk of a load of one ton may be easily calculated:

Cast Iron	450 pounds.	Common Soil, compact, about	124 pounds.
Water	62 "	Clay, about	135 "
White Pine, seasoned, about	30 "	Clay, with stones, about	160 "
White Oak, " "	52 "	Brick, about	125 "
Loose Earth, about	95 "	Stone, about	170 "

BULK OF A TON OF DIFFERENT SUBSTANCES.

23 cubic feet of Sand make about a ton.
18 cubic feet of Earth " "
17 cubic feet of Clay " "

18 cubic feet of gravel or earth, before digging, make 27 cubic feet when dug; or, the bulk is increased as three to two.

TO MEASURE GRAIN IN THE GRANARY.

Divide the cubic feet by 56, multiply by 45, and the result will be struck measure in bushels.

TO MEASURE CORN IN THE CRIB.

Multiply the length, breadth and height together, in feet, to obtain the cubic feet; multiply this product by 4, and strike off the right figure; and the result will be shelled bushels, nearly.

UNITED STATES BUSHEL AND GALLON.

The United States bushel, adopted now by the State of New York, is

2150.40 cubic inches. The gallon 231 cubic inches. The dry measure gallon, or one-eighth of the bushel, is 268.8 cubic inches.

WEIGHT OF GRAIN.

The laws of this State established the following weights, avoirdupois, to the bushel, of the articles named, in the absence of a specific contract:

	Pounds.		Pounds.
Wheat	60	Timothy	44
Indian Corn	56	Clover Seed	60
Rye	56	Flaxseed	56
Buckwheat	48	Potatoes	60
Barley	48	Dried Apples	22
Oats	32	Dried Peaches	32
Beans	62	Salt	56
Peas	60	Onions	57

CAPACITY OF SOILS FOR WATER.

The following substances are saturated when they contain, of their own weight:

Sand	about 24 per cent. of water
Calcareous Sand	28 " "
Loamy Soil	38 " "
Clay Loam	47 " "
Peat	80 " "

Table showing the number of rails, stakes, and riders required for each 10 *rods of fence.*

Length of rail.	Deflection from right line.	Length ofpanel	No. of panels.	No. of rails for each 10 rods.			Number of stakes.	Number of riders. (Single.)
Feet.	Feet.	Feet.	Feet.	5 rails high	6 rails high	7 rails high.		
12	6	8	20⅝	103	123	144	42	21
14	7	10	16½	83	99	116	34	17
16½	8	12	13¾	69	84	95	28	14

Table showing the number of rails and posts required for 10 *rods of post and rail fence.*

Length of rail.	Length of panel.	Number of panels.	Number of posts.	Number of rails for each 10 rods.			
Feet.	Feet.			5 rails high	6 rails high	7 rails high	8 rails high
10	8	20⅝	21	103	123	144	165
12	10	16½	17	83	99	116	133
14	12	13¾	14	69	84	95	109
16½	14½	11⅓	12	57	69	81	93

Table showing the number of loads of manure, and the number of heaps to each load, required to each acre, the heaps at given distances apart.

Distance of heaps apart, in yards.	NUMBER OF HEAPS IN A LOAD.									
	1	2	3	4	5	6	7	8	9	10
3	538	269	179	134	108	89½	77	67	60	54
3½	395	168	132	99	79	66	56½	49½	44	39½
4	233	151	101	75½	60½	50½	43¼	37¾	33½	30¼
4½	239	120	79½	60	47¾	39¾	34¼	30	26½	24
5	194	97	64½	48½	38¾	32¼	27¾	24¼	21½	19¼
5½	160	89	53½	40	32	26¾	22¾	20	17¾	16
6	131	67	44¾	33½	27	22½	19¼	16¾	15	13½
6½	115	57½	38¼	28¾	23	19	16¼	14¼	12¾	11½
7	99	49½	33	24¾	19¾	16½	14	12¼	11	10
7½	86	43	28¾	21½	17¼	14¼	12¼	10¾	9½	8½
8	75½	37¾	25¼	19	15¾	12½	10¾	9½	8½	7½
8½	67	33½	22¼	16¾	13½	11¼	9½	8½	7½	6¾
9	60	30	20	15	12	10	8½	7¾	6¾	6
9½	53½	26¾	18	13½	10¾	9	7¾	6¾	6	5¼
10	48½	24¼	16¼	12	9¾	8	7	6	5½	4¾

Table showing the relative values of decomposed vegetables as manures, from the inorganc matter they contain.

	Inorganic matter. lbs. lbs.
1 ton Wheat Straw made into manure returns to the soil	70 to 136
1 " Oat " " " " "	160 to 180
1 " Hay " " " " "	100 to 200
1 " Barley " " " " "	100 to 120
1 " Pea " " " " "	100 to 110
1 " Bean " " " " "	100 to 130
1 " Rye " " " " "	50 to 100
1 " Dry Potato-tops " " " "	400
1 " Dry Turnip-tops " " " "	370
1 " Rape Cake " " " "	120
1 " Malt Dust " " " "	180
1 " Dried Seaweed " " " "	560

Johnston.

Table showing the relative value of decomposed vegetables as manures, from the nitrogen they contain.

100 lbs. of farm-yard manure is equal to

	Manure.
130 lbs. Wheat Straw	Manure.
150 " Oat "	"
180 " Barley "	"
85 " B'wheat "	"
45 " Pea "	"
50 " Wheat Chaff	"
80 " Green Grass	"
75 " Potato Tops	"
80 lbs. Fresh Seaweed	Manure.
20 " Dried "	"
26 " Bran of Wheat or Corn	"
13 " Malt Dust	"
8 " Rape Cake	"
250 " Pine Sawdust	"
180 " Oak "	"
25 " Coal Soot	"

Boussingault.

Table showing the labor one horse is able to perform at different rates of speed on canals, railroads and turnpikes. Drawing force 83 1-3 lbs.

Speed per hour. Miles.	Duration of day's work—hours.	Useful effect for 1 day in tons, drawn 1 mile.		
		On canal—tons.	On a railroad—tons.	On a turnpike—tons.
2½	11⅓	520	115	14
3	8	243	92	12
3½	6	154	82	10
4	4⅓	102	72	9
5	2 9-10	52	57	7.3
6	2	30	48	6
7	1⅓	19	41	5
8	1⅛	12.8	36	4.5
9	9-10	9.	32	4
10	¾	6.5	28.8	3.6

Average composition, per cent. and per ton, of various kinds of agricultural produce, etc.

	PER CENT.				LBS. PER (LONG) TON.						Value of manure in $ and cts., from 1 ton (2000 lbs.) of food.
	Total dry manure.	Total mineral matter (Ash)	Phosphoric acid reckoned as phosphate of lime.	Potash.	Nitrogen.	Total dry matter.	Total mineral matter (Ash)	Phosphoric acid reckoned as phosphate of lime.	Potash.	Nitrogen.	
1. Linseed cake	88.0	7.00	4.92	1.65	4.75	1,971	156.8	110.2	37.0	106.4	19.72
2. Cotton-seed	89.0	8.00	7.00	3.12	6.50	1,994	179.2	156.8	70.0	145.6	27.86
3. Rape cake	89.0	8.00	5.75	1.76	5.00	1,994	179.2	128.8	39.4	112.0	21.01
4. Linseed	90.0	4.00	3.38	1.37	3.80	2,016	89.6	75.7	30.7	85.1	15.65
5. Beans	84.0	3.00	2.20	1.27	4.00	1,882	67.2	49.3	28.4	89.6	15.75
6. Peas	84.0	2.40	1.84	0.96	3.40	1,893	53.8	41.2	21.5	76.2	13.38
7. Tares	84.5	2.00	1.63	0.66	4.20	1,892	44.8	36.5	14.8	94.1	16.75
8. Lentils	88.0	3.00	1.89	0.96	4.30	1,971	67.2	42.3	21.5	96.3	16.51
9. Malt dust	94.0	8.50	5.23	2.12	4.20	2,106	190.4	117.1	47.5	94.1	18.21
10. Locust beans	85.0	1.75	...	....	1.25	1,904	39.2	.. .	....	28.0	4.81
11. Indian meal	88.0	1.30	1.13	0.35	1.80	1,971	29.1	25.3	7.8	40.3	6.65
12. Wheat	85.0	1.70	1.87	0.50	1.80	1,904	38.1	42.0	11.2	40.3	7.08
13. Barley	84.0	2.20	1.35	0.55	1.65	1,882	49.3	30.2	12.3	37.0	6.32
14. Malt	95.0	2.60	1.60	0.65	1.70	2,128	58.2	35.8	14.6	38.1	6.65
15. Oats	86.0	2.85	1.17	0.50	2.00	1,926	63.8	26.2	11.2	44.8	7.70
16. Fine pollard*	86.0	5.60	6.44	1.46	2.60	1,926	125.4	144.2	32.7	58.2	13.53
17. Coarse pollard†	86.0	6.20	7.52	1.49	2.58	1,926	138.9	168.4	33.4	57.8	14.36
18. Wheat bran	86.0	6.60	7.95	1.45	2.55	1,926	147 8	178.1	32.5	57.1	14.59
19. Clover hay	84.0	7.50	1.25	1.30	2.50	1,882	168.0	28.0	29.1	56.0	9.64
20. Meadow hay	84.0	6.00	0.88	1.50	1.50	1,882	134.4	19.7	33.6	33.6	6.43
21. Bean straw	82.5	5.55	0.90	1.11	0.90	1,848	124.3	20.2	24.9	20.2	3.87
22. Pea straw	82.0	5.95	0.85	0.89	....	1,837	133.3	19.0	19.9	20.2	3.74
23. Wheat straw	84.0	5.00	0.55	0.65	0.60	1,882	112.0	12.3	14.6	13.4	2.68
24. Barley straw	85.0	4.50	0.37	0.63	0.50	1,904	100.8	8.3	14.1	11.2	2.25
25. Oat straw	83.0	5.50	0.48	0.93	0.60	1,859	123.2	10.7	20.8	13.4	2.90
26. Mangel wurzel	12.5	1.00	0.09	0.25	0.25	280	22.4	2.0	5.6	5.6	1.07
27 Swedish turnips	11.0	0.68	0.13	0.18	0.22	246	13.4	2.9	4.0	4.6	0.91
28. Common turnips	8.0	0.68	0.11	0.29	0.18	179	15.2	2.5	6.5	4.0	0.86
29. Potatoes	24.0	1.00	0.32	0.43	0.35	537	22.4	7.2	9.6	7.8	1 50
30. Carrots	13.5	0.70	0.12	0.23	0.20	302	15.7	2.9	5.1	4.5	0.80
31. Parsnips	15.0	1.00	0.42	0.36	0.22	336	22.4	9.4	8.1	4.9	1.14

*Middlings, Canielle. †Shipstuff.

The foregoing table, showing the composition of various foods and the estimated value of the manure made by animals consuming a ton of them, was prepared by John B. Lawes, of Rothamstead. The composition of the foods is undoubtedly correct; the estimated money value must be taken only relatively. The figures given are in gold, and are based on English prices of guano and other commercial manures. New York prices are from one-quarter to one-third higher.

It will be seen that cotton seed cake makes the richest manure of any food in the list. Linseed oil-cake, peas, beans, malt dust, and bran are among the most valuable foods. Coarse bran is frequently sold at a price that would make it, after deducting the value of the manure, one of the most profitable foods to purchase. Clover hay stands high in the list.

Table showing the proportion of solid matter and water in 100 *parts each of the following articles of diet.*

Designation.	Solid Matter.	Water.	Designation.	Solid Matter.	Water.	Designation.	Solid Matter.	Water.
Wheat	87	13	Lean beef	26	74	Carrots	13	87
Peas	87	13	Eggs	26	74	Beets	13	87
Rice	86	14	Veal	25	75	Milk	13	87
Beans	86	14	Potatoes	25	75	Oysters	13	87
Rye	86	14	Pork	24	76	Cabbage	8	92
Corn	86	14	Codfish	21	79	Turnips	7	93
Oatmeal	74	26	Blood	20	80	Watermelon	5	95
Wheat bread	51	49	Trout	19	81	Cucumber	3	97
Mutton	29	71	Apples	18	82			
Chicken	27	73	Pears	16	84			

Table showing the contents of circular cisterns in barrels for each foot in depth.

5 feet	4.66	8 feet	11.93
6 "	6.74	9 "	5.10
7 "	9.13	10 "	8.65

Table showing the contents of circular cisterns, from 1 *foot to* 25 *feet in diameter, for each* 10 *inches in depth.*

Diameter.	Gallons.	Diameter.	Gallons.
1	4.896	7½	271.072
1½	11.015	8	313.340
2	19.583	8½	353.735
2½	30.545	9	396.573
3	44.064	9½	441.861
3½	59.980	10	489.600
4	78.333	11	592.400
4½	99.116	12	705.
5	122.400	13	827.450
5½	148.546	14	959.613
6	176.253	15	1101.610
6½	206.855	20	1958.421
7	239.906	25	3059.034

Table showing the period of reproduction and gestation of domestic animals.

Designation	Proper age for reproduction.	Period of the power of reproduction in years.	Number of females for one male.	Period of gestation and incubation.		
				Shortest period, days.	Mean period, days.	Longest period, days.
Mare	4 years.	10 to 12	.....	322	347	419
Stallion	5 "	12 to 15	20 to 30	...	...	...
Cow	3 "	10 to 14	.....	240	283	321
Bull	3 "	8 to 10	30 to 40	...	...	...
Ewe	2 "	6	.....	146	154	161
Ram	2 "	7	40 to 50	...	...	...
Sow	1 "	6	.....	109	115	142
Boar	1 "	6	6 to 10	...	...	...
She Goat	2 "	6	.....	150	156	163
He Goat	2 "	5	20 to 40	...	...	...
She Ass	4 "	10 to 12	.....	365	380	391
He Ass	5 "	12 to 15	.....	...	...	...
She Buffalo	.....	8	.....	281	308	335
Bitch	2 "	8 to 9	.....	55	60	63
Dog	2 "	8 to 9	.....	...	...	...
She Cat	1 "	5 to 6	.....	48	50	56
He Cat	1 "	9 to 10	5 to 6	...	...	...
Doe Rabbit	6 months.	5 to 6	.....	20	28	35
Buck Rab't	6 "	5 to 6	30	...	...	...
Cock	6 "	5 to 6	12 to 15	...	...	...
Hen	.....	5 to 6	.....	19	21	24
Turkey	.....	3 to 5	.....	24	26	30
Duck	.....	.....	.....	28	30	32
Goose	.....	.....	.....	27	30	33
Pigeon	.....	.....	.....	16	18	20
Pea Hen	.....	.....	.....	25	28	30
Guinea Hen	.....	.....	.....	20	23	25
Swan	.....	.....	.....	40	42	45

Table showing the price of pork per pound at different prices per bushel for corn.

Corn per bushel. Cents.	Pork per pound. Cents.	Corn per bushel. Cents.	Pork per pound. Cents.
12½	1.50	38	4.52
15	1.78	40	4.76
17	2.	42	5.
20	2.38	45	5.35
22	2.62	50	5.95
25	2.96	55	6.54
30	3.57	60	7.14
33	3.92	65	7.74
35	4.	70	8.57

Hay in a mow ten feet drop, put in in good order, and not too ripe when cut, ought to average one ton to each 525 cubic feet. The compression increases rapidly as the height increases, and a mow of the same hay, fifteen feet drop, would probably turn out a ton to 475 cubic feet, if not even to 425 feet. All such guessing, however, is very hazardous, and it is always safer to buy or sell only by actual weight.

Perhaps it would be a safe formula to say, sell at 400 cubic feet and buy at 600 cubic feet.

Table showing the price per cwt. of hay at given prices per ton.

Price per ton.	½ hundred.	1 hundred.	2 hundred.	3 hundred.	4 hundred.	5 hundred.	6 hundred.	7 hundred.	8 hundred.	9 hundred.	10 hundred.	11 hundred.
$	cts	cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
4	10	20	40	60	80	1.00	1.20	1.40	1.60	1.80	2.00	2.20
5	12	25	50	75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75
6	15	30	60	90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3 30
7	17	35	70	1.05	1.40	1.75	2.10	2.45	2.80	3.15	3.50	3.85
8	20	40	80	1.20	1.60	2.00	2.40	2.80	3.20	3.60	4.00	4.40
9	22	45	90	1.35	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.95
10	25	50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50
11	27	55	1.10	1.65	2.20	2.75	3.30	3.85	4.40	4.95	5.50	6.00
12	30	60	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40	6.00	6.60
13	32	65	1.30	1.95	2.60	3.25	3.90	4.55	5.20	5.85	6.50	7.15
14	35	70	1.40	2 10	2.80	3.50	4.20	4.90	5.60	6.30	7.00	7.70
15	37	75	1.50	2.25	3.00	3.75	4.50	5.25	6.00	6.75	7.50	8.25

FORCE OF WIND.

The force exerted by windmills will vary greatly with the velocity of the wind. The following table shows the pressure against a fixed surface; from the velocity given in this table, the average velocity of the sails must be deducted, and the remainder will show the real force exerted:

Velocity. Miles an hour.	Pressure in lbs. on square ft.	Description.
1	.005	Hardly perceptible.
2	.020	Just perceptible.
3	.045	
4	.089	Light breeze.
5	.125	
6	.180	Gentle, pleasant wind.
7	.320	
10	.500	Pleasant, brisk wind.
15	1.125	
20	2.000	Very brisk.
25	3.125	
30	4.500	Strong, high wind.
35	6.125	
40	8.000	Very high.
45	10.125	
50	12.500	Storm or tempest.
60	18.000	Great storm.
80	32.000	Hurricane.
100	50.000	Tornado, tearing up trees and sweeping off buildings.

VALUE OF DIFFERENT KINDS OF WOOD AS FUEL.

The celebrated experiments of Marcus Bull, of Philadelphia, many years ago gave the following results, showing the amount required to throw out a given quantity of heat:

Hickory	4 cords.	Pitch Pine	9 1-7 cords.
White Oak	4 3-4 "	White	9 1-5 "
Hard Maple	6 2-3 "	Anthracite Coal	4 tons.
Soft Maple	7 1-5 "	Bituminous Coal	5 "

TEMPERATURE FOR THE RISING OF CREAM.

The temperature of the surrounding air has a great effect upon the time required for the rising of the cream. Experiment has demonstrated that, with the thermometer at

80 deg.	all the cream will rise in 10 hours.	55 deg.	all the cream will rise in 24 hours.
77 "	" " " 12 "	50 "	" " " 36 "
68 "	" " " 18 "	45 "	" " " 43 "

Weight of a bushel of agricultural produce, etc., as established by law in the United States, Territories, and British Provinces, compared with the most recent enactments.

ARTICLES.	California.	Canada.	Connecticut.	Dakota.	Delaware.	Illinois.	Indiana.	Iowa.	Kansas.	Kentucky.	Louisiana.	Maine.	Maryland.	Massachusetts.	Michigan.	Minnesota.	Missouri.	Nebraska.	Nevada.	New Brunswick.	New Hampshire.	New Jersey.	New York.	Nova Scotia.	Ohio.	Oregon.	Pennsylvania.	Rhode Island.	Vermont.	Washington Ter.	Wisconsin.
Apples	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	..	..	..	45	..
Barley	50	48	48	48	..	48	48	48	48	48	32	48	..	48	48	48	48	48	50	50	..	48	48	†52	48	46	47	..	48	45	48
Bran	..	..	..	..	..	20	..	20	20	20	..	..	..	..	..	..	20	20	..	..	..	..	..	..	..	..	..	..	..	..	..
Broom Corn Seed	..	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Buckwheat	40	48	48	42	..	52	50	52	50	52	..	48	..	48	48	42	52	52	40	50	..	50	48	..	50	42	48	..	46	42	42
Carrots	..	60	55	..	..	..	..	..	..	..	..	50	..	..	..	..	..	..	..	56	..	..	..	..	..	..	..	50	..	50	..
Castor Beans	..	40	..	..	..	46	46	46	46	..	..	..	..	..	46	..	46	46	..	..	..	..	..	..	..	..	..	..	..	..	..
Coal, Mineral	..	..	..	..	..	80	*80	80	80	..	..	..	..	..	80	..	80	80	..	..	..	..	..	..	‡80	..	..	..	..	..	..
Corn, Shelled	52	56	..	56	56	56	56	56	56	56	56	56	..	56	56	56	56	56	52	60	56	56	58	58	56	56	56	..	56	56	56
Corn, in Ear	..	..	56	72	..	70	68	70	70	..	..	..	..	..	70	..	..	70	..	..	..	..	..	..	70	..	..	..	..	..	..
Corn Meal	..	..	..	..	..	48	50	..	..	50	..	..	..	50	50	..	..	50	..	..	50	..	..	..	60	..	..	50	..	..	..
Cranberries	..	50	..	..	..	..	..	..	..	..	..	..	..	..	40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dried Apples	..	22	..	..	..	24	25	24	24	..	..	..	..	..	22	28	24	24	..	..	..	..	..	..	25	28	..	..	..	28	28
Dried Peaches	..	•33	..	..	..	33	33	33	33	..	..	..	..	..	28	28	33	33	..	..	..	..	..	..	33	28	..	..	..	28	28
Dried Plums	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Flax Seed	..	50	..	..	..	56	..	56	56	56	..	..	..	..	56	..	56	56	..	..	..	55	55	..	56	..	..	..	..	..	56
Grass Seed, Blue	..	14	..	..	..	14	14	14	..	14	..	..	..	..	14	..	14	14	..	..	..	..	..	..	..	..	..	..	..	..	..
Grass Seed, Clover	..	60	..	60	..	60	60	60	60	60	..	..	..	..	60	60	60	60	..	..	..	64	60	..	62	60	62	..	60	60	60
Grass Seed, Hungarian	..	..	..	..	..	..	..	45	..	..	..	..	..	..	50	..	..	60	..	..	..	..	..	..	50	..	..	..	..	..	..
Grass Seed, Millet	..	..	..	..	..	..	..	45	..	..	..	..	..	..	50	..	..	85	..	..	..	..	..	..	50	..	..	..	..	..	..
Grass Seed, Orchard	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Grass Seed, Red Top	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Grass Seed, Timothy	..	48	..	42	..	45	45	45	45	45	..	..	..	..	45	..	45	45	..	40	..	..	44	..	45	..	..	..	42	40	46
Hair, Plastering	..	..	..	..	..	8	..	..	..	..	..	..	..	..	..	..	..	8	..	..	..	..	..	..	..	..	..	..	..	..	..
Hemp Seed	..	44	..	..	..	44	44	44	44	44	..	..	..	..	44	..	44	44	..	..	..	..	..	..	44	..	..	..	..	..	..
Lime, Unslacked	..	..	..	..	..	80	..	80	..	..	..	..	..	..	..	..	..	80	..	..	..	..	..	39	34	..	..	..	..	..	..
Malt	..	36	..	..	..	38	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..

*Mined within the State, 70 lbs.; without the State, 80 lbs. †Foreign—Barley produced in the Province, 48 lbs. ‡Bituminous—Cannel Coal, 70 lbs.

Weight of the bushel of agricultural produce, etc. (continued).

ARTICLES.	California.	Canada.	Connecticut.	Dakota.	Delaware.	Illinois.	Indiana.	Iowa.	Kansas.	Kentucky.	Louisiana.	Maine.	Maryland.	Massachusetts.	Michigan.	Minnesota.	Missouri.	Nebraska.	Nevada.	New Brunswick.	New Hampshire.	New Jersey.	New York.	Nova Scotia.	Ohio.	Oregon.	Pennsylvania.	Rhode Island.	Vermont.	Washington Ter.	Wisconsin.
Mangel Wurzel	..	..	60	..	..	..	..	..	..	..	..	60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	..	..	..
Oats	32	34	32	32	..	32	..	33	32	33½	32	30	..	32	32	32	35	34	32	36	30	30	32	34	33	36	30	..	30	35	32
Onions	..	60	50	..	..	57	49	57	57	57	..	52	..	52	54	.	57	57	..	56	..	..	..	..	..	..	..	50	..	50	..
Onions, Top	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Osage-Orange Seed	..	..	..	..	..	..	.	32	..	..	..	..	..	..	33	..	..	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Parsnips	..	60	45	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	..	..	..	60	..	..	50	..	..	..	..
Pears	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	..	..	..	..	45	..
Peas	..	60	60	..	..	..	..	..	..	..	..	60	..	..	60	..	..	60	..	..	..	..	60	..	..	..	..	..	60	60	..	..
Potatoes, Irish	..	60	60	60	..	60	60	60	60	56	..	..	56	60	60	..	60	60	..	56	60	60	60	..	60	60	56	60	..	60	60
Potatoes, Sweet	..	..	..	..	..	55	..	46	..	..	..	..	..	..	56	..	..	50	..	..	..	..	..	..	50	..	..	..	..	..	..	..
Ruta Baga	..	..	60	..	..	..	..	..	..	..	..	60	..	..	..	..	..	..	..	56	..	..	..	..	..	..	..	50	..	..	50	..
Rye	54	56	56	56	..	56	56	56	56	56	32	56	..	56	56	56	56	56	54	56	56	56	56	56	56	56	56	..	56	56	56
Salt, Coarse	..	..	..	..	..	..	..	.	..	..	..	..	..	..	..	..	..	.	..	..	..	..	..	..	..	..	85	..	..	..	..	..
Salt, Fine	..	..	..	..	..	55	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	62	..	..	..	..	..
Salt, Ground	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	70	..	..	..	..	..
Sand	..	..	..	..	..	..	..	130	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sugar Beets	..	60	60	..	..	..	..	..	..	..	..	60	..	..	..	..	..	..	56	..	..	..	..	..	..	..	..	50	..	50	..	..
Turnips	..	60	50	..	..	55	..	..	..	..	..	50	..	..	58	..	..	55	..	56	..	..	..	..	..	..	..	50	..	50	..	..
Wheat	60	60	60	60	60	60	60	60	60	60	60	60	..	60	60	60	60	60	60	60	60	60	60	60	60	60	60	..	60	60	60
White Beans	..	60	60	60	..	60	60	60	60	60	.	64	..	.	60	..	60	60	.	.	60	..	62	..	60	..	..	..	60	60	..

"Salt" in Canada is 56 pounds to the bushel; in Illinois, Indiana, Iowa, Kansas, Kentucky, Missouri, and Nebraska it is 50 pounds to the bushel. In Michigan, "Michigan Salt," is 56 pounds to the bushel. In Massachusetts "Salt" is 70 pounds to the bushel.

Coal in Kentucky is 76 pounds per bushel, except Wheeling coal, which is 84, and Kentucky River, which is 78 pounds per bushel, and Adrian Branch, or Cumberland River coal, which is 72 pounds per bushel. Cotton seed is 33 pounds to the bushel in Missouri.

Sorghum seed is 30 pounds to the bushel in Iowa and Nebraska. Strained honey is 12 pounds to the gallon in Nebraska.

To reduce cubic feet to bushels, struck measure, divide the cubic feet by 56 and multiply by 45.

VELOCITY OF WATER IN TILE DRAINS.

An acre of land in a wet time contains about 1,000 spare hogsheads of water. An underdrain will carry off the water from a strip of land about two rods wide, and one 80 rods long will drain an acre.

The following table will show the size of the tile required to drain an acre in two days' time (the longest admissible) at different rates of descent, or the size of any larger area:

Diameter of Bore.	Rate of Descent.	Velocity of current per second.	Hogsheads discharged in 24 hours.
2 inches	1 foot in 100	22 inches	400
2 "	1 " 50	32 "	560
2 "	1 " 20	51 "	900
2 "	1 " 10	73 "	1,290
3 "	1 " 100	27 "	1,170
3 "	1 " 50	38 "	1,640
3 "	1 " 20	67 "	3,100
3 "	1 " 10	84 "	3,600
4 "	1 " 100	32 "	2,500
4 "	1 " 50	45 "	3,500
4 "	1 " 20	72 "	5,600
4 "	1 " 10	100 "	7,800

A deduction of one-third to one-half must be made for the roughness of the tile or imperfection of laying. The drain must be of some length to give the water velocity, and these numbers do not, therefore, apply to very short drains.

CAPACITY OF BOXES.

A box 4 feet 7 inches long, 2 feet 4 inches wide, 2 feet 4 inches deep, holds 20 bushels; a box 24 in. x 16 in. x 28 in., 5 bushels; box, inches, 24x11.2x8, 1 bushel, box, inches, 12x11.2x8, ½ bushel; box, inches, 8x8.-4x8, 1 peck; box, inches, 8x8x4.2, 1 gallon; box inches, 4x4x1.2, 1 quart. A cylinder 18½ in. inside diameter, 8 inches deep, contains U. S. standard bushel. Any box containing the same number of cubic inches will hold same quantity as above sizes. To obtain a box holding any portion or multiple of above quantities, divide or multiply any one dimension of the box accordingly.

Table showing the number of days from any day in one month to the same day in any other.

FROM	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
January	365	31	59	90	120	151	181	212	243	273	304	334
February	334	365	28	59	89	120	150	181	212	242	273	303
March	306	337	365	31	61	92	122	153	184	214	245	275
April	275	306	334	365	30	61	91	122	153	183	214	244
May	245	276	304	335	365	31	61	92	123	153	184	214
June	214	245	273	304	334	365	30	61	92	122	153	183
July	184	215	243	274	304	335	365	31	62	92	123	153
August	153	184	212	243	273	304	334	365	31	62	92	122
September	122	153	181	212	242	273	304	334	365	30	61	91
October	92	123	151	282	211	243	273	304	335	365	31	61
November	61	92	120	151	181	212	242	273	304	334	365	30
December	31	62	90	121	151	182	212	243	274	304	335	365

EXPLANATION.—Find, in the left-hand column, the month from any day of which you wish to compute the number of days to the same day

in any other month, and follow the line along until under the latter, and you have the required number of days. Thus, from the 12th of April to the 12th of October, is 183 days; from the 7th of March to the 7th of June, 92 days.

Table showing the square feet and the feet square of the fractions of an acre.

Fractions of an acre.	Square feet.	Feet square.	Fractions of an acre.	Square feet.	Feet square.
1-16	2722½	52½	½	21780	147½
⅛	5445	73¾	1	43560	208¼
¼	10890	104½	2	87120	295¼
⅓	14520	120½			

GOVERNMENT LAND MEASURE.

A township is 6 miles square, and contains 36 sections, or 23,040 acres.

A section is 1 mile square, and contains 640 acres.

A quarter-section is half a mile square, and contains 160 acres.

A half quarter-section is half a mile long, almost universally north and south and one-fourth of a mile wide, and contains 80 acres.

A quarter quarter-section is one-fourth of a mile square, and contains 40 acres. It is the smallest sized tract, except fractions, sold by the government.

TO FIND THE NUMBER OF BUSHELS OF GRAIN IN A GRANARY.

RULE.—Multiply the length in inches by the breadth in inches, and that again by the depth in inches, and divide the product by 2150 (the number of cubic inches in a bushel), and for heaped bushels by 2748, and the quotient will be the answer.

EXAMPLE.—Given a granary 9 feet long by 4 wide and 6 deep. How many bushels will it contain?

SOLUTION.—108 inches length, times 48 inches width, times 72 in. depth =373248÷2150=173.65 bus. *Ans.*

MEASUREMENT OF CORN IN THE CRIB.

After levelling the corn, multiply the length and breadth of the house together, and the product by the depth, which will give the cubic feet of the bulk of corn: then divide this last product by 12, and the quotient will be the number of barrels of shelled corn contained in the house or crib. If there be a remainder after the division, it will be so many twelfths of a barrel of shelled corn over.

Example.

12 feet long
11 feet broad

132
6 feet deep

12)792 cubic feet

66 barrels shelled corn
5 bushels in a barrel

330 bushels shelled corn.

Memoranda.—21,500 cubic inches will contain ten bushels of shelled corn, but the same space filled with corn in the ear will shell out rather more than five bushels. These 21,500 cubic inches contain 12 cubic feet, and 764 cubic inches over. Now, two barrels, or ten bushels in the ear, will generally, in shelling, overrun just about these 764 cubic inches.

PLOWING.

Names of Fields.	Length of land. Yards.	Breadth to give an acre. Yds.	Breadth of the furrow slice. Inches.	No. of furrows in an acre.	Time that it takes in turning. Hours and minutes.	Time taken in turning the soil. Hours and minutes.	No. of hours in the day's work.
Short lands.....	78	186	8	279	4 39	3 21	8
Harper's Hill.....	149	98	8	147	2 27	5 33	8
Home Close.....	200	73	8	109	1 49	6 11	8
East Lake.....	212	69	8	103	1 43	6 17	8
Long Lands.....	274	53	8	79	1 19	6 41	8

EXPLANATION.—When the land is no more than 78 yards long, 4 hours and 39 minutes are spent merely in turning at the ends, in a journey of 8 hours; whereas, when the land is 274 yards long, 1 hour and 19 minutes are sufficient for that purpose in the same length of time.

The whole series of furrows on an acre of land, supposing each to be 9 inches in width, would extend in length to 19,360 yards; and, adding 12 yards to every 220, for the average estimated ground traveled over in turning, the whole work of ploughing one acre may be given as extending to 20,416 yards, or 11 miles and nearly five furlongs.

TABLE FOR MANURING LAND.

EXPLANATON.—The left-hand column shows the distance of the heaps of manure in yards, the figures at the top the number of heaps in a load, and under them the number of loads required for an acre for any given distance of the heaps:—thus, if heaps of clay are set 3½ yards asunder, and 5 heaps made of a load, then under five in the table, and opposite 3½ yards in the width, you will find 80, which shows the number of loads required for an acre. Again, if the heaps of dung are 7 yards distant from each other, and 8 heaps made of a load, the table shows that 13 loads are required to manure an acre.

Distance of the heaps	1 Heaps in a load.	2 Heaps in a load.	3 Heaps in a load.	4 Heaps in a load.	5 Heaps in a load.	6 Heaps in a load.	7 Heaps in a load.	8 Heaps in a load.	9 Heaps in a load.	10 Heaps in a load.
Yards	Loads.	Loads.	Loads.	Loads.	Loads.	Loads.	Loads	Loads.	Loads	Loads
1	4840	2420	1614	1210	968	807	692	605	538	484
1½	2152	1076	718	538	431	359	308	269	240	216
2	1210	605	404	303	242	202	173	152	135	121
2½	775	388	259	194	155	130	111	97	87	78
3	538	269	180	135	108	90	77	68	60	54
3½	396	198	132	99	80	66	57	50	44	40
4	303	152	101	76	61	51	44	38	34	31
4½	240	120	80	60	48	40	35	30	27	24
5	294	97	65	49	39	33	28	25	22	20
5½	160	80	54	40	32	27	23	20	18	16
6	135	68	45	34	27	23	20	17	15	14
6½	115	58	39	29	23	20	17	15	13	12
7	99	50	33	25	20	17	15	13	11	10
7½	87	44	29	22	18	15	13	11	10	9
8	76	38	26	19	16	13	11	10	9	8
8½	67	34	23	17	14	12	10	9	8	7
9	60	30	20	15	12	10	9	8	7	6
9½	54	27	18	14	11	9	8	7	6	6
10	49	25	17	13	10	9	7	7	6	5

POWER REQUIRED TO GRIND GRAIN.

TO GRIND GRAIN WITH PORTABLE MILLS:

Horse Power.	Size of Stones.	Revolutions per minute.	Bushels corn per hour.	Bushels wheat per hour.
2 to 5	12 inch.	800 to 900	1 to 4	1 to 3
5 to 8	20 "	650 to 700	5 to 8	4 to 6
8 to 11	30 "	550 to 600	10 to 15	7 to 10
12 to 18	36 "	450 to 500	18 to 25	12 to 15
20 to 30	48 "	350 to 400	25 to 35	15 to 18

OAT MEAL.—It takes about 12 bushels of oats to make a barrel of 200 lbs. of oat meal; another rating estimates that 14 lbs. of oats produces 8 lbs. of oat meal—try it.

One bushel of buckwheat, or 50 lbs., will produce 25 lbs. of buckwheat meal; more may be obtained, but the quality will be impaired.

One bushel of good wheat (60 lbs.), is estimated to make 40 lbs. of flour; *i. e.*, 2½ bushels of wheat for 100 lbs. of flour.

A barrel of flour weighs 196 lbs.; a barrel of pork, 200 lbs.; a barrel of beef, 200 lbs.; a barrel of salt, 180 lbs.; a firkin of butter, 56 lbs.; corn, 5 bushels to the barrel; potatoes, 2¼ bushels to the barrel.

The following table gives nearly the following quantities of meal flour and bread, viz.:

Wheat weighing	60	pounds	makes	45	pounds	of flour, and	54	pounds of bread
Rye	"	54	"	42	"	"	56	"
Barley	"	48	"	37½	"	"	50	"
Oats	"	40	"	22½	"	"	30	"

HOW SHALL WE SELL HOGS?

A question of financial importance to farmers is often asked of each other in regard to the shrinkage of hogs in dressing to decide what should be the difference in the price between live and dressed hogs. A close calculator selected twenty pigs, they were well fed and fattened though not large, with the following results. We give below the exact weights, alive and dressed:

No.	Live weight.	Dressed weight.	No.	Live weight.	Dressed weight.
1	172	143	11	131	113
2	151	128	12	176	145
3	155	130	13	148	118
4	126	104	14	153	128
5	135	116	15	164	138
6	163	136	16	148	120
7	130	108	17	133	115
8	136	114	18	168	139
9	153	128	19	132	114
10	148	120	20	113	90
	Total, live weight	2,935.		Total, dressed weight	2,447.

Shrinkage, 488 pounds, or a trifle over one-seventh. He was offered $4.00 per 100 for the lot on foot, but sold for $5.10 dressed, a gain of $7.62 in favor of dressing, and the rough lard was sufficient to pay for butchering. Farmers can look this over at their leisure, and decide how they will sell.

STRENGTH OF ICE.

Ice 2 inches thick will bear men on foot.
Ice 4 inches thick will bear men on horseback.
Ice 6 inches thick will bear cattle and teams with light loads.
Ice 8 inches thick will bear teams with heavy loads.
Ice 10 inches thick will sustain a pressure of 1,000 pounds per square foot.

This supposes the ice to be sound through its whole thickness, without "snow ice."

SHRINKAGE OF GRAIN.

Farmers rarely gain by holding on to their grain after it is fit for market, when the shrinkage is taken into account. Wheat from the time it is threshed will shrink two quarts to the bushel, or six per cent., in six months, in the most favorable circumstances. Hence, it follows that ninety-four cents a bushel for wheat when first threshed in August, is as good, taking into account the shrinkage alone, as one dollar in the following February.

Corn shrinks much more from the time it is husked. One hundred bushels of ears, as they come from the field in November, will be reduced to not far from eighty. So that 40 cents a bushel for corn in the ear, as it comes from the field, is as good as 50 in March, shrinkage only being taken into account.

In the case of potatoes—taking those that rot and are otherwise lost—together with the shrinkage, there is but little doubt that between October and June, the loss to the owner who holds them is not less than thirty-three per cent.

This estimate is taken on the basis of interest at 7 per cent., and takes no account of loss by vermin.

SIZE OF NAILS.

The following table will show at a glance the length of the various sizes, and the number of nails in a pound. They are rated 3-penny up to 20-penny:

No.	Length in inches.	Nails per lb.	No.	Length in inches.	Nails per lb.
2-penny	1	557	8-penny	2½	101
4 "	1¼	535	10 "	2¾	68
5 "	1¾	282	12 "	3	54
6 "	2	177	20 "	3½	34
7 "	2¼	141			

From the foregoing table an estimate of quantity and suitable size for any job of work can easily be made.

GROWTH AND LIFE OF ANIMALS.

Man grows for 20 years and lives	90 or 100 years.
The Horse grows for 5 years, and lives	30 "
The Ass grows for 5 years, and lives	30 "
The Ox grows for 4 years, and lives	15 to 20 "
The Cow grows for 4 years, and lives	20 "
The Hog lives	12 to 15 "
The Sheep lives	10 "
The Camel grows for 8 years, and lives	40 "
The Lion grows for 4 years, and lives	40 "
The Dog grows for 2 years, and lives	12 to 14 "
The Cat grows for 1½ years, and lives	9 or 10 "
The Hare grows for 1 year, and lives	8 "
The Guinea Pig grows 7 months, and lives	6 or 7 "

The Beaver lives	30	years.
The Deer and Wolf live	20	"
The Fox lives	14 to 16	"
The Squirrel lives	7	"
The Rabbit lives	7	"
The Eagle lives	100	"
Geese live	20	"
Hens and Pigeons live	10 to 15	"

The Elephant, 100 years; Codfish 14 to 17 years; Eels, 10 years; Crocodile, 100 years; Queen Bees, 4 years; Drones, 4 months; Worker Bees, 6 months.

TABLE OF WEIGHTS,

Showing estimated number of pounds of barbed wire required to fence space or distance mentioned, with one, two or three lines of wire, based upon each pound of wire measuring one rod (16½ feet), by H. B. Scott & Co., Buffalo, N. Y.

	ONE LINE.	TWO LINES.	THREE LINES.
1 Square Acre	50¾ lbs.	101¼ lbs.	152 lbs.
1 Side of a Square Acre	12⅔ "	25⅓ "	38 "
1 Square Half Acre	36 "	72 "	108 "
1 Square Mile	1280 "	2560 "	3840 "
1 Side of a Square Mile	320 "	640 "	960 "
1 Rod in Length	1 "	2 "	3 "
100 Rods in Length	100 "	200 "	300 "
100 Feet in Length	6 1-16 "	12⅛ "	18 3-16 "

SHINGLES.

Shingles are usually 16 inches long, and a bundle of shingles is 20 inches wide, and contains 24 courses in the thickness at each end; hence, a bundle of shingles will lay one course 80 feet long. When shingles are exposed 4 inches to the weather, 1,000 will cover 107 square feet; 4½ inches, 120 square feet; 5 inches, 132 square feet; 6 inches, 160 square feet.

DURABILITY OF SHINGLES.

The following table exhibits the average durability of shingles in exposed situations:

Rafted Pine Shingles, from 20 to 35 years.	Cedar.....from 12 to 18 years.
Sawed, clear from sap, " 16 to 22 "	Spruce..... " 7 to 11 "
" " with sap, " 4 to 7 "	

Note—By soaking shingles in lime-water, their durability is considerably increased.

RELATIVE HARDNESS OF WOODS.

Taking shell bark as the highest standard of our forest trees, and calling that 100, other trees will compare with it as follows:

Shell Bark Hickory	100	Yellow Oak	60
Pignut Hickory	96	White Elm	58
White Oak	84	Hard Maple	56
White Ash	77	Red Cedar	56
Dogwood	75	Wild Cherry	55
Scrub Oak	73	Yellow Pine	54
White Hazel	72	Chestnut	52
Apple Tree	70	Yellow Poplar	51
Red Oak	60	Butternut	43
White Beech	65	White Birch	43
Black Walnut	65	White Pine	30
Black Birch	62		

ROPES.

Table showing what weights hemp rope will bear with safety.

CIRCUMFERENCE.	POUNDS.	CIRCUMFERENCE.	POUNDS.
1 inch.	200	3 inch.	1800
1¼ "	312.5	3¼ "	2112.5
1½ "	450	3½ "	2450
1¾ "	612.5	3¾ "	2812.5
2 "	800	4 "	3200
2¼ "	1012.5	5 "	5000
2½ "	1250	6 "	7200
2¾ "	1512.5		

NOTE.—A square inch of hemp fibres will support a weight of 9200 pounds. The maximum strength of a good hemp rope is 6400 pounds to the square inch. Its practical value not more than one-half this strain. Before breaking, it stretches from one-fifth to one-seventh, and its diameter diminishes one-fourth to one-seventh. The strength of manilla is about one-half that of hemp. White ropes are one-third more durable.

TABLE.

	Per Hour.	Per Second.
A man travels	3 miles	4 feet.
A horse trots	7 "	10 "
A horse runs	20 "	29 "
Steamboats run	18 "	26 "
Sailing vessels run	10 "	14 "
Slow rivers flow	3 "	4 "
Rapid rivers flow	7 "	10 "
A moderate wind blows	7 "	10 "
A storm moves	36 "	52 "
A hurricane moves	80 "	117 "
A rifle ball moves	1000 "	1466 "

ACCURATE WOOD MEASURE.—LENGTH EIGHT FEET.

WIDTH.		HEIGHT IN FEET.				HEIGHT IN INCHES.										
Feet.	Inches.	1	2	3	4	1	2	3	4	5	6	7	8	9	10	11
1	6	20	40	60	80	2	3	5	7	8	10	12	13	15	17	18
	7	21	41	62	82	2	3	5	7	8	10	12	14	15	17	18
	8	21	42	64	85	2	4	5	7	9	11	13	14	16	18	20
	9	22	44	66	88	2	4	6	8	9	11	13	15	17	18	20
	10	23	45	68	91	2	4	6	8	10	11	13	15	17	19	21
	11	23	47	70	94	2	4	6	8	10	12	14	15	17	19	21
3	0	24	48	72	96	2	4	6	8	10	12	14	16	18	20	22
	1	25	49	74	99	2	4	6	8	10	12	14	17	18	20	22
	2	25	51	76	101	2	4	6	8	10	13	15	17	19	21	23
	3	26	52	78	104	2	4	7	9	11	13	15	17	20	22	24
	4	27	53	80	107	2	5	7	9	11	14	16	18	20	23	25
	5	27	55	82	109	2	5	7	9	11	14	16	18	20	23	25
	6	28	56	84	112	2	5	7	9	12	14	16	18	21	23	26
	7	29	57	86	115	3	5	8	10	12	15	17	19	22	24	27
	8	29	59	88	117	3	5	8	10	12	15	17	19	22	24	27
	9	30	60	90	120	3	5	8	10	13	15	18	20	23	26	28
	10	31	61	92	123	3	5	8	10	13	16	18	21	23	26	29
	11	31	63	94	125	3	5	8	10	13	16	18	21	23	26	29
4	0	32	64	96	128	3	5	8	11	13	16	19	21	24	27	29

EXPLANATION.—Find the width of the load in the left hand column of the table; then move to the right, on the same line, till you come under the height in feet, and

you have the contents in feet; then move to the right on the same line till you come to the height in inches, and you have the additional contents in feet for the height in inches. The sum of these two gives the true contents in feet. For loads 12 feet long, add one-half, and for 4 feet, subtract one-half.

Example.—If a load of wood be 2 feet 10 inches wide, and 3 feet 7 inches high, what are the contents? Against 2 feet 10 inches, and under 3 feet, stands 68; and under 7 inches at the top, stands 13; then 13 plus 68 equals 81, the true contents in feet.

BRICKS.

Bricks may be estimated at 24 to a cubic foot, and five courses to one foot in height. But as bricks are not often of full size, the following allowances are made for each square foot of the surface on the face of a wall, namely:

8 inch wall.....16 to a square foot	16 inch wall.....32 to a square foot.
12 " " .....24 " "	20 " " .....40 " "

CHIMNEYS.

Bricks, for chimneys, may be estimated for each foot in height, as follows:

Size of Chimney.	Size of Flue.	No. of Bricks to each foot in height.	Size of Chimney.	Size of Flue.	No. of Bricks to each foot in height.
16 x 16	8 x 8	30	16 x 24	8 x 16	40
20 x 20	12 x 12	40	20 x 24	12 x 16	45

TABLE SHOWING HOW MANY SACKS ARE REQUIRED AT DIFFERENT WEIGHTS TO PUT UP ONE BARREL OF FLOUR.

No. lbs. in Sack.	Sacks in bbl.	lbs.	No. lbs. in Sack.	Sacks in bbl.	lbs.
5	39	1	55	3	31
10	19	6	60	3	16
15	13	1	65	3	1
20	9	16	70	2	56
25	7	21	75	2	46
30	6	16	80	2	36
35	5	21	85	2	26
40	4	36	90	2	16
45	4	16	95	2	6
50	3	46	100		96

CORD—WOOD ON AN ACRE.

To estimate the quantity of cord-wood on an acre of woodland requires experience. A person who has been engaged in clearing land and cutting wood could give a very close estimate at a general glance, but other persons would make the wildest guesses. An inexperienced person may commence as follows: Measure out four square rods of ground; that is, thirty-three feet each way, and count the trees, averaging the cubic contents, as near as possible, of the trunks, and adding one-fourth of this for the limbs. Then, as 128 cubic feet make a cord, and the plat is one-fourth of an acre, the result is easily reached. Fairly good timber land should yield a cord to every four square rods. A tree two feet in diameter and thirty feet high to the limbs, will make a cord

of wood if it is growing in close timber, and the limbs are not heavy. If the limbs are large and spreading, such a tree will make 1¼ to 1½ cords. A tree one foot in diameter will make one-fourth as much as one twice the diameter. In estimating, it is necessary to remember this fact.

ROUND TIMBER.

Round timber, when squared, is estimated to lose one-fifth; hence, a ton of round timber is said to contain only 40 cubic feet.

Sawed timber, as joists, plank and scantlings, are now generally bought and sold by board measure. The dimensions of a foot of board measure is 1 foot long, 1 foot wide, and 1 inch thick.

TO MEASURE ROUND TIMBER.

RULE.—Take the girth in inches at both the large and small ends, add them, and divide their sum by two for the mean girth; then multiply the length in feet by the square of one-fourth of the mean girth in inches; divide the product by 144, and the quotient will be the contents in cubic feet.

EXAMPLE.—What are the cubic contents of a round log 12 feet long, 54 inches girth at the large end, and 34 at the small end?

SOLUTION.—54 plus 34 88-:-2=44 inches mean girth.

Then 12 length times 121 inches (the square of ¼ mean girth)= 1452-:-144=10 1-12 cubic feet. *Ans.*

SQUARE TIMBER.

TO MEASURE SQUARE TIMBER.

RULE.—Multiply the breadth in inches by the depth in inches, and that by the length in feet, and divide the product by 144, and the quotient will be the contents in cubic feet.

EXAMPLE.—What are the cubic contents of a square log 12 feet long by 20 inches broad and 18 deep?

SOLUTION.—20 times 18=360 times 12=4320-:-144=30 cubic feet. *Ans.*

COMPUTE WEIGHT OF CATTLE.

The following table is compiled from two English works on the subject:

Girth.		Length.		Renton's Table.		Cary's Table.	
ft.	in.	ft.	in.	stone.	lb.	stone.	lb.
5	0	3	6	21	0	21	00
5	0	4	0	24	0	24	00
5	6	3	9	27	1	27	00
5	6	4	0	34	4	34	07
6	0	4	6	38	8	38	11
6	0	5	0	43	1	43	00
6	6	4	6	45	9	45	07
6	6	4	9	48	0	48	00
7	0	5	6	64	6	64	07
7	0	6	0	70	5	70	03
8	0	6	6	99	8	99	12
8	0	7	0	107	5	107	06

TABLE OF SIMPLE INTEREST, AT SIX PER CENT.,

FOR EACH DAY TO A MONTH, FROM $1 TO $100.

Amount.	DAYS IN THE MONTH.																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
4	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
5	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3
6	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
7	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4
8	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	4	4	4
9	0	0	0	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	4	4	4	4	5	5
10	0	0	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	5
20	0	1	1	1	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10	10
30	1	1	1	1	2	2	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	15
40	1	1	2	2	3	4	5	5	6	7	7	8	9	9	10	11	11	12	13	13	14	15	15	16	17	17	18	19	19	20	20
50	1	2	3	3	4	5	6	7	8	8	9	10	11	12	13	13	14	15	16	17	17	18	19	20	21	22	23	23	24	25	26
60	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
70	1	2	3	5	6	7	8	9	10	12	13	14	15	16	17	19	20	21	22	23	24	26	27	28	29	30	31	33	34	35	36
80	1	3	4	5	7	8	9	11	12	13	15	16	17	19	20	21	23	24	25	27	28	29	31	32	33	35	36	37	39	40	41
90	2	3	5	6	7	9	11	12	13	15	16	18	19	21	22	24	25	27	28	30	31	33	35	36	38	39	41	42	44	45	47
100	2	3	5	7	8	10	12	13	15	17	18	20	22	23	25	27	28	30	32	33	35	37	38	40	42	43	45	47	48	50	51

EXPLANATION.—Find the amount in the left-hand column, then follow the line of figures until you come to the column giving the number of days at the head, and you have the amount of days to one month; then, by adding together, you have the interest of as many months as required on amounts from one dollar to one hundred.

TABLE OF SIMPLE INTEREST, AT SEVEN PER CENT.,

FOR EACH DAY TO A MONTH, FROM $1 TO $100.

Amount.	DAYS IN THE MONTH.																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2
4	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
5	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4
6	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4
7	0	0	0	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	4	4	4	4
8	0	0	0	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5
9	0	0	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5
10	0	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6
20	0	1	1	2	2	2	3	3	3	4	4	5	5	5	6	6	7	7	7	8	8	8	9	9	10	10	10	11	11	12	12
30	1	1	2	2	3	3	4	5	5	6	6	7	7	8	9	9	10	10	11	12	12	13	13	14	14	15	16	16	17	17	18
40	1	2	2	3	4	5	5	6	7	8	8	9	10	11	12	12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	24
50	1	2	3	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
60	1	2	3	5	6	7	8	9	10	12	13	14	15	16	17	18	20	21	22	23	24	25	26	28	29	30	31	32	33	35	36
70	1	3	4	5	7	8	9	11	12	13	15	16	17	19	20	21	23	24	26	27	28	29	31	32	34	35	36	38	39	40	42
80	2	3	5	6	8	9	11	12	14	15	17	18	20	21	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44	46	48
90	2	3	5	7	9	10	12	14	16	17	19	21	22	24	26	28	29	31	33	35	36	38	40	41	43	45	47	48	50	52	54
100	2	4	6	8	10	12	13	15	17	19	21	23	25	27	29	30	33	35	36	38	40	42	44	46	48	50	52	54	56	58	59

EXPLANATION.—Find the amount in the left hand column, then follow the line of figures until you come to the column giving the number of days at the head, and you have the amount of days to one month; then, by adding together, you have the interest of as many months as required, on amounts from one dollar to one hundred.

RATE OF WAGES PER WEEK, RANGING FROM FIFTY CENTS TO TWO DOLLARS AND SEVENTY-FIVE CENTS.

DAYS.	50 Cts.	62½ Cts	75 Cts.	87½ Cts	$1	$1.12½	$1.25	$1.37½	$1.50	$1.62½	$1.75	$1.87½	$2	$2.25	$2.50	$2.75
	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.
¼	.2	.2½	.3	.3½	.4	.4¾	.5¼	.5¾	.6¼	.6¾	.7¼	.7¾	.8¼	.9¼	.10½	.11½
½	.4	.5¼	.6¼	.7¼	.8¼	.9¼	.10½	.11½	.12½	.13½	.14½	.15½	.16½	.18¾	.20¾	.23
¾	.6¼	.7¾	.9¼	.10¾	.12½	.14	.15½	.17¼	.18¾	.20¼	.23¾	.23½	.25	.28	.31¼	.34¼
1	.8¼	.10½	.12½	.14½	.16½	.18¾	.20¾	.23	.25	.27	.29	.31¼	.33¼	.37½	.41¾	.45¾
1¼	.10½	.13	.15½	.18¼	.20¾	.23½	.26	.28½	.31¼	.33¾	.36¼	.39	.41½	.46¾	.52	.57¼
1½	.12½	.15½	.18¾	.22	.25	.28	.31¼	.34¾	.37½	.40½	.43¾	.46¾	.50	.56¼	.62½	.68¾
1¾	.14½	.18	.21¾	.25½	.29	.32¾	.36½	.40	.43¾	.47¼	.51	.54¾	.58¼	.65½	.73	.80¼
2	.16½	.20¾	.25	.29	.33¼	.37½	.41½	.45¾	.50	.54	.58¼	.62½	.66½	.75	.83¼	.91½
2¼	.18¾	.23½	.28	.32¾	.37½	.42¼	.46¾	.51½	.56¼	.61	.65½	.70¼	75	.84¼	.93½	1.03
2½	.20¾	.26	.31¼	.36½	.41½	.46¾	.52	.57¼	.62½	.67¾	.73	.78	.83¼	.93¾	1.04	1.14¼
2¾	.23	.28¾	.34¼	.40	.45¾	.51½	.57¼	.63	.68¾	.74½	.80¼	.86	.91½	1.03	1.14½	1.26
3	.25	.31¼	.37½	.43¾	.50	.56¼	.62½	.68¾	.75	.81¼	.87½	.93¾	1.	1.12½	1.25	1.37½
3¼	.27	.33¾	.40½	.47¼	.54	.61	.67¾	.74½	.81¼	.88	.94¾	1.01½	1.08¼	1.21¾	1.35½	1.49
3½	.29	.36¼	.43¾	.51	.58¼	.65½	.72¾	.80¼	.87½	.94¾	1.02	1.09½	1.16½	1.31¼	1.46	1.60¼
3¾	.31¼	.39	.46¾	.54½	.62½	.70¼	.78	.86	.93¾	1.01½	1.09¼	1.17¼	1.25	1.40½	1.56¼	1.71¾
4	.33¼	.41½	.50	.58¼	.66½	.75	.83¼	.91½	1.	1.08¼	1.16½	1.25	1.33¼	1.50	1.66½	1.83¼
4¼	.35¼	.44	.53	.62	.70¾	.79¾	.88½	.97¼	1.06¼	1.15	1.23¾	1.32¾	1.41½	1.59¼	1.77	1.94¾
4½	.37½	.46¾	.56¼	.65½	.75	.84¾	.93¾	1.03	1.12½	1.21¾	1.31¼	1.40½	1.50	1.68¾	1.87½	2.06
4¾	.39½	.49¼	.59¼	.69¼	.79	.89¾	.98¾	1.08¾	1.18¾	1.28½	1.38½	1.48¼	1.58¼	1.78	1.97¾	2.17½
5	.41½	.52	.62½	.73	.83¼	.93¾	1.04	1.14½	1.25	1.35¼	1.45¾	1.56¼	1.66½	1.87½	2.08¼	2.29
5¼	.43¾	.54½	.65½	.76½	.87½	.98¼	1.09¼	1.20¼	1.31¼	1.42¼	1.53¼	1.64	1.75	1.96¾	2.18¾	2.40½
5½	.45¾	.57¼	.68¾	.80	.95¾	1.03	1.14½	1.26	1.37½	1.49	1.60½	1.71¾	1.83½	2.06¼	2.29	2.52
5¾	.47¾	.59¾	.71¾	.83¾	.93¾	1.07¾	1.19¾	1.31¾	1.43¾	1.55¾	1.67¾	1.79¾	1.91½	2.15½	2.39½	2.63½
6	.50	.62½	.75	.87½	1.	1.12½	1.25	1.37½	1.50	1.62½	1.75	1.87½	2.	2.25	2.50	2.75
7	.58¼	.72¾	.87½	1.02	1.16½	1.31¼	1.45¾	1.60½	1.75	1.89½	2.04	2.18¾	2.33¼	2.62½	2.91½	3.20¾
8	.66½	.83¼	1.	1.16½	1.33¼	1.50	1.66½	1.83¼	2.	2.16½	2.33¼	2.50	2.66½	3.	3.33¼	3 66½
9	.75	.93¾	1.12½	1.31¼	1.50	1.68¾	1.87½	2.06¼	2.25	2.43¾	2.62½	2.81¼	3.	3.37½	3.75	4.12½
10	.83¼	1.04	1.25	1.45¾	1.66½	1.87½	2.08¼	2.29	2.52	2.70¾	2.91½	3.12½	3.33½	3.75	4.16¾	4.58¾
11	.91¾	1.14¼	1.37½	1.60¼	1.83¼	2.06¼	2.29	2.50	2.75	2.98	3.20¾	3.43¾	3.66½	4.12½	4.58¼	5.04
12	1.	1.25	1.50	1.75	2.	2.25	2.50	2.75	3.	3.25	3.50	3.75	4.	4.50	5.	5.50
18	1.50	1.87½	2.25	2.62½	3.	3.37½	3.75	4.12½	4.50	4.87½	5.25	5.62½	6.	6.75	7.50	8.25
24	2.	2.50	3.	3.50	4.	4.50	5.	5.50	6.	6.50	7.	7.50	8.	9.	10.	11.
26	2.16½	2.71	3.25	3.79	4.33¼	4.87½	5.42	5.96	6.50	7.04	7.58¼	8.12½	8.66½	9.75	10.83¼	11.91½

RATE OF WAGES PER WEEK, RANGING FROM THREE DOLLARS TO SEVEN AND A HALF DOLLARS.

DAYS.	$3.	$3.25	$3.50	$3.75	$4.	$4.25	$4.50	$4.75	$5.	$5.25	$5.50	$5.75	$6.	$6.50	$7.	$7.50
	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.	Dols C.
¼	.12½	.13½	.14¼	.15½	.16½	.17¾	.18¾	.19¾	.20¾	.21¾	.23	.24	.25	.27	.29	.31¼
½	.25	.27	.29	.31¼	.33¼	.35½	.37½	.39½	.41½	.43¾	.45¾	.48	.50	.54	.58¼	.62½
¾	.37½	.40½	.43¾	.46¾	.50	.53	.56¼	.59¼	.62½	.65½	.68¾	.71¾	.75	.81¼	.87½	.93¾
1	.50	.54	.58¼	.62½	.66½	.70¾	.75	.79	.83¼	.87½	.91½	.95¾	1.	1.08¾	1.16½	1.25
1¼	.62½	.67½	.72¾	.78	.83¼	.88½	.93¾	.98¾	1.04	1.09¼	1.14½	1.19¾	1.25	1.35¼	1.45¾	1.56¼
1½	.75	.81¼	.87½	.93¾	1.	1.06¼	1.12½	1.18¾	1.25	1.31¼	1.37½	1.43¾	1.50	1.62½	1.75	1.87½
1¾	.87½	.94¾	1.02	1.09¾	1.16½	1.24	1.31¼	1.38½	1.45¾	1.53	1.60½	1.67¾	1.75	1.89½	2.04	2.18¾
2	1.	1.08¼	1.16½	1.25	1.33¼	1.41½	1.50	1.58¼	1.66½	1.75	1.83¼	1.91½	2.	2.16¼	2.33¼	2.50
2¼	1.12½	1.21¾	1.31¼	1.40½	1.50	1.59¼	1.68¾	1.78	1.87½	1.96¾	2.06¼	2.15½	2.25	2.43½	2.62½	2.81¼
2½	1.25	1.35¼	1.45¾	1.56¼	1.66½	1.77	1.87½	1.98	2.08¼	2.18¾	2.29	2.39½	2.50	2.70¾	2.91½	3.12½
2¾	1.37½	1.48¾	1.60¼	1.71¾	1.83¼	1.94¾	2.06¼	2.17¾	2.29	2.40½	2.52	2.63½	2.75	2.98	3.20¾	3.43¾
3	1.50	1.62½	1.75	1.87½	2.	2.12½	2.25	2.37½	2.50	2.62½	2.75	2.87½	3	3.25	3.50	3.75
3¼	1.62½	1.76	1.89½	2.03	2.16½	2.30¾	2.43¾	2.57¼	2.70¾	2.84¼	2.98	3.11½	3.25	3.52	3.75	4.06¼
3½	1.75	1.89½	2.04	2.18¾	2.33¼	2.48	2.62½	2.77	2.91¾	3.06¼	3.20¾	3.35½	3.50	3.79	4.08¼	4.37½
3¾	1.87½	2.03	2.18¾	2.34¼	2 50	2.65¾	2.81¼	2.96¾	3.12½	3.28	3.43¾	3.59¼	3.75	4.06¼	4 37½	4.68¾
4	2	2.16½	2.33¼	2.50	2.66¾	2.83¼	3.	3.16½	3.33¼	3.50	3.66½	3.83¼	4.	4.33¼	4.66¾	5.
4¼	2.12½	2.30	2.47¾	2.65¼	2.83¼	3.01	3.18¾	3.36½	3.54¼	3.71¾	3.89½	4.07¼	4.25	4.60¾	4.95¾	5.31¼
4½	2.25	2.43¾	2.62½	2.81¼	3.	3.18¾	3.37½	3.56¾	3.75	3.93¾	4.12½	4.31¼	4.50	4.87½	5.25	5.62½
4¾	2.37½	2.57¼	2.77	2.96¾	3 16½	3.36½	3.56¼	3.76	3.95¾	4.15½	4.35¼	4.55¼	4.75	5.14½	5.54	5.93¾
5	2.50	2.70¾	2.91½	3.12½	3.33¼	3.54¼	3.75	3.95¾	4.16½	4.37½	4.58¼	4.79	5.	5.41¼	5.83¼	6.25
5¼	2.62½	2.84¼	3.06¼	3.28	3.50	3.72	3.93¾	4.15½	4 37½	4.59¼	4 81¼	5.03	5.25	5.68¾	6.12½	6.56¼
5½	2.75	2.98	3.20¾	3.40¾	3.65½	3 89½	4.12½	4.35½	4.58¼	4.81¼	5.04	5.27	5.50	5.95¾	6.41½	6.87½
5¾	2.87½	3.11½	3.35½	3.59¼	3.83¼	4.07¼	4.31¼	4.58¼	4.79	5.03	5.27	5.51	5.75	6 22¾	6.70¾	7.18¾
6	3.	3.25	3.50	3.75	4.	4.25	4.50	4.75	5.	5.25	5.50	5.75	6.	6.50	7	7.50
7	3.50	3.79	4.08¼	4.37½	4.66½	4.95¾	5.25	5.54	5.83¼	6.12½	6.41½	6.70¾	7.	7.58¼	8.16½	8.75
8	4.	4.33¼	4.66½	5.	5.33¼	5.66½	6.	6.33¼	6.66½	7.	7.33¼	7.66½	8.	8.66½	9.33¼	10.
9	4.50	4.87½	5.25	5.62½	6.	6.37½	6.75	7.12½	7.50	7.87½	8.25	8.62½	9.	9.75	10.50	11.25
10	5.	5.41½	5.83¼	6.25	6.66½	7.08¼	7.50	7.91½	8.33¼	8.75	9.16½	9.58¼	10.	10.83¼	11.66½	12.50
11	5.50	5.95¾	6.41½	6.87½	7.33¼	7.79	8.25	8.70¾	9.16½	9.62½	10.08¼	10.54	11.	11.91½	12.83¼	13.75
12	6.	6.50	7.	7.50	8.	8.05	9.	9.50	10.	10.50	11.	11.50	12.	13.	14.	15.
18	9.	9.75	10.50	11.25	12.	12.75	13.50	14.25	15.	15.75	16.50	17.25	18.	19.50	21.	22.50
24	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	26.	28.	30.
26	13.	14 08¼	15.16½	16.25	17.33¼	18.41¾	19.50	20.58¼	21.66¼	22.75	23.83¼	24.91¾	26.	28.16½	30.33¼	32.50

RATE OF WAGES PER WEEK, RANGING FROM EIGHT DOLLARS TO FIFTEEN DOLLARS.

DAYS.	$8.	$8.50.	$9.	$9.50.	$10.	$10.50.	$11.	$12.	$13.	$13.50.	$14.	$15.
	Dols. C.	Dols. C.	Dols. C.	Dols. C.	Dols. C.	Dols. C.	Dols. C.	Dols. C.	Dols. C.	Dols. C.	Dols. C.	Dols. C.
¼	.33¼	.35½	.37½	.39½	.41¾	.43¾	.45¾	.50	.54	.56¼	.58½	.62½
½	.66½	.70¾	.75	.79	.83½	.87½	.91¾	1.	1.08⅓	1.12½	1.16¾	1.25
¾	1.	1.06¼	1.12½	1.18¾	1.25	1.31¼	1.37½	1.50	1.62½	1.68¾	1.75	1.87½
1	1.33¼	1.41⅓	1.50	1.58¼	1.66¾	1.75	1.83⅓	2.	2.16¾	2.25	2.33½	2.50
1¼	1.66½	1.77	1.87½	1.98	2.08⅓	2.18¾	2.29	2.50	2.70¾	2.81¼	2.91¾	3.12½
1½	2.	2.12½	2.25	2.37½	2.50	2.62½	2.75	3.	3.25	3.37½	3.50	3.75
1¾	2 33¼	2.48	2.62½	2.77	2.91¾	3.06¼	3.20¾	3.50	3.79	3.93¾	4.08⅓	4.37½
2	2.66⅔	2.83⅓	3.	3.16⅓	3.33⅓	3.50	3.66¾	4.	4.33⅓	4.50	4.66¾	5.
2¼	3.	3.18¾	3.37½	3.56¼	3.75	3.93¾	4.12½	4.50	4.87½	5.06¼	5.25	5.62½
2½	3.33¼	3.54⅓	3.75	3.96	4.16¾	4.37½	4.58⅓	5.	5.41¾	5.62½	5.83⅓	6.25
2¾	3.66½	3.89⅓	4.12½	4.35½	4.58⅓	4.81⅓	5.04	5.50	5.93¾	6.18¾	6.41¾	6.87½
3	4.	4.25	4.50	4.75	5.	5.25	5.50	6.	6.50	6.75	7.	7.50
3¼	4.33¼	4.60¼	4.87½	5.14⅓	5.41⅔	5.68¾	5.95¾	6.50	7.04	7.31¼	7.58⅓	8.12½
3½	4.66½	4.95	5.25	5.54	5.83⅓	6.12½	6.41¾	7.	7.58⅓	7.87½	8.16¾	8.75
3¾	5.	5.31¼	5.62½	5.93¾	6.25	6.56¼	6.87½	7.50	8.12½	8.43¾	8.75	9.37½
4	5.33¼	5.66¾	6.	6.33¼	6.66¾	7.	7.33½	8.	8.66¾	9.	9.33½	10.
4¼	5.66½	6.02¼	6.37½	6.73¾	7.08⅓	7.43¾	7.79	8.50	9.20¾	9.56¼	9.91¾	10.62½
4½	6.	6.37½	6.75	7.12½	7.50	7.87½	8.25	9.	9.75	10.12½	10.50	11.25
4¾	6.33¼	6.73	7.12½	7.52	7.91¾	8.31½	8.70¾	9.50	10.29	10.68¾	11.08⅓	11.87½
5	6.66½	7.08¼	7.50	7.91½	8.33⅓	8.75	9.16¾	10.	10.83⅓	11.25	11.66¾	12.50
5¼	7.	7.43¾	7.87½	8.31¼	8.75	9.18¾	9.62½	10.50	11.37½	11.81¼	12.25	13.12½
5½	7.33¼	7.79¼	8.25	8.70¾	9.16¾	9.62½	10.08⅓	11.	11.91¾	12.37½	12.83⅓	13.75
5¾	7.66½	8.14⅓	8.62½	9.10⅓	9.58⅓	10.06¼	10.54	11.50	12.45¾	12.93¾	13.41¾	14.37½
6	8.	8.50	9.	9.50	10.	10.50	11.	12.	13.	13.50	14.	15.
7	9.33¼	9.91⅔	10.50	11.08¼	11.66¾	12.25	12.83⅓	14.	15.16¾	15.75	16.33⅓	17.50
8	10.66½	11.33¼	12.	12.66½	13.33⅓	14.	14.66¾	16.	17.33⅓	18.	18.66¾	20.
9	12.	12.75	13.50	14.25	15.	15 75	16.50	18.	19.50	20.25	21.	22.50
10	13.33¼	14.16⅔	15.	15.83¼	16.66¾	17.50	18.33⅓	20.	21.66¾	22.50	23.33½	25.
11	14.66½	15.58¼	16.50	17.41½	18.33⅓	19.25	20.16¾	22.	23.83⅓	24.75	25.66¾	27.50
12	16.	17.	18.	19.	20.	21.	22.	24.	26.	27.	28.	30.
18	24.	25.50	27.	28.50	30.	31.50	33.	36.	39.	40.50	42.	45.
24	32.	34.	36.	38.	40	42.	44.	48.	52.	54.	56.	60.
26	34.66½	36.83¾	39.	41.16½	43.33½	45.50	47.66¾	52.	56.33½	58.50	60.66¾	65.

BOARD BY THE WEEK.

The following table will also answer for calculating the amount of wages by the week or month of hired girls, servants, etc., who are compelled to labor on the Sabbath, being calculated for seven days in the week.

Multiply these tables by four, and you have wages by the month.

Showing the rate of board per day, at $1.00 per week.		Showing the rate of board per day, at $1.25 per week.		Showing the rate of board per day, at $1.50 per week.		Showing the rate of board per day, at $1.75 per week.	
Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c.
1	14¼	1	17¾	1	21¼	1	25
2	28½	2	35¾	2	43	2	50
3	42¾	3	53½	3	64¼	3	75
4	57	4	71½	4	85¾	4	1.00
5	71	5	89¼	5	1.07	5	1.25
6	85¾	6	1.07¼	6	1.28½	6	1.50
7	1.00	7	1.25	7	1.50	7	1.75
At $2.00		At $2.25.		At $2.50.		At $2.75.	
Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c.
1	28½	1	32	1	35¾	1	39¼
2	57	2	64¼	2	71½	2	78½
3	85¾	3	96¼	3	1.01¼	3	1.17¾
4	1.14¼	4	1.28½	4	1.43	4	1.57
5	1.42¾	5	1.60½	5	1.78¾	5	1.96½
6	1.71½	6	1.92¾	6	2 14¼	6	2.35¾
7	2.00	7	2.25	7	2.50	7	2.75
At $3.00.		At $3.25.		At $3.50.		At $3 75.	
Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c.
1	43	1	46½	1	50	1	53½
2	85¾	2	93	2	1.00	2	1.07
3	1.28¾	3	1.38½	3	1.50	3	1.60½
4	1.71½	4	1.85¾	4	2.00	4	2.14¼
5	2.14¼	5	2.32¼	5	2.50	5	2.67¾
6	2.57	6	2.78½	6	3.00	6	3.21½
7	3.00	7	3.25	7	3.50	7	3.75
At $4.00.		At $4.50.		At $5.00.		At $6.00.	
Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c
1	57	1	64¼	1	71½	1	85¾
2	1.14¼	2	1.28½	2	1.43	2	1.71½
3	1.71¼	3	1.92¾	3	2.14¼	3	2.57¼
4	2.28½	4	2.57	4	2.85¾	4	3.43
5	2.85½	5	3.21½	5	3.57	5	4.28½
6	3.42¾	6	3.85¾	6	4.71½	6	5.14¼
7	4.00	7	4.50	7	5.00	7	6.00
At $7.00.		At $8.00.		At $9.00.		At $10.00.	
Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c.	Days.	Dols. c.
1	1.00	1	1.14¼	1	1.28½	1	1.42¾
2	2.00	2	2.28½	2	2.57	2	2.85½
3	3.00	3	3.42¾	3	3.85¾	3	4.28½
4	4.00	4	4.57	4	5.14¼	4	5.71½
5	5.00	5	5.71½	5	6.43	5	7.14¼
6	6.00	6	6.85¾	6	7.71½	6	8.57
7	7.00	7	8.00	7	9.00	7	10.00

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